Transit-Accessible Workforce Housing Opportunities in Atlanta

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An Analysis of Housing and Employment Characteristics Near Current and Future Transit Lines

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Abstract

Affordable housing, jobs, and transportation infrastructure are central elements of urban planning that have the potential for great synergies if considered comprehensively. Transit-accessible affordable housing can help alleviate the combined housing and transportation burden that many Atlantans face and provide better accessibility to employment opportunities. The region's upcoming Transportation Investment Act (TIA) vote provides an impetus to study these issues and determine how this potential infrastructure investment could influence the supply of mixed-income transit-oriented developments (MITOD) that provide affordable housing and increase connections to jobs.

The two research questions being explored are: *What are the current housing and employment characteristics near MARTA rail stations and the proposed transit routes identified in the TIA? Where might opportunities exist to preserve affordable housing and develop MITOD?* The analysis utilizes spatial analysis techniques in a geographic information system (GIS) to study the most recent Census 2010 and American Community Survey data. A series of thematic maps exhibit the findings and important densities and ratios are analyzed to make observations about the nature of the connection between housing and jobs via transit.

The study finds that existing housing and job densities are below recommended thresholds for transit usage, which indicates the importance of infill strategies and MITOD policies to encourage future growth in transit-rich neighborhoods. Affordable housing (less than 50% AMI) is in short supply in many transit-accessible locations, while workforce housing (less than 80% AMI) is more prevalent, supporting the need for truly affordable housing in new development. High housing vacancies and currently undeveloped land around existing and future rail lines provide opportunities for new MITOD to address these challenges.

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Introduction

Three major elements of urban planning have the potential for great synergies if considered comprehensively. The provision of affordable housing is a significant public policy issue that was magnified when prices skyrocketed during the last real estate boom and remains a crucial struggle. Transportation infrastructure investment represents a tremendous expenditure of public funds and has been extolled as a tool to bolster the economy while enhancing mobility and creating transportation options. Robust, accessible employment markets are critical for a city's residents to obtain productive jobs and for a city's ability to attract and retain residents, especially during the current recession.

The upcoming Transportation Investment Act (TIA) vote, also known as the Regional Transportation Referendum (RTR) and the Transportation Special-Purpose Local-Option Sales Tax (T-SPLOST), provides an opportunity to address these issues by encouraging mixed-income transit-oriented development. Such development around existing and new station areas would increase the supply of affordable and workforce housing near transit and connect more low income residents with jobs and opportunities. It will also help alleviate the combined housing and transportation burden that many Atlantans face. Households in Atlanta spent an average of 29 percent of their income on housing costs in 2006, just below the generally accepted threshold of affordability. However, they also spent an average of 32 percent of their income on transportation expenses, making that the most significant portion of their annual expenditures (Center for Transit Oriented Development [CTOD], 2009a). Spending 61 percent of household income on these two expenses severely limits other basic necessities.

The primary research question being explored is: *How might the balance between workforce housing and transit-accessible jobs in Atlanta be improved, given the TIA vote in July 2012 and the transit projects on the final list?*

To do this, a spatial analysis of housing and job characteristics around proposed transit lines in the TIA project list is conducted using a geographic information system (GIS) and the findings compared against an analysis of those same characteristics around existing MARTA rail stations. Important densities and ratios are analyzed to make observations about the nature of the connection between housing and jobs via transit. After an overview of other transit-oriented development funds in several cities across the United States, policy recommendations tailored to the unique characteristics of Atlanta are offered.

Literature Review

The relationship between affordable housing, employment location, and transportation infrastructure has been a subject of research from many different angles for some time now. This literature review presents and synthesizes some of the key findings in order to create a framework for analyzing transit-accessible affordable housing in Atlanta and the extent to which it connects low and moderate income households with job opportunities. It begins with an overview of the research into the combined cost of housing and transportation and its impact on households. Next, it presents research on the link between housing and access to jobs, with a particular focus on linking low income households with employment via public transit. This area in particular is a subject of divergent viewpoints. Then, mixed-income, transit-oriented development (MITOD) is explored as a strategy for addressing these interrelated issues of housing, transportation, and jobs. Finally, the review draws conclusions about the nature of these relationships to guide research efforts on Atlanta's current heavy rail system, MARTA, and a series of proposed transit projects to be funded by the TIA's one-cent sales tax if a July 2012 referendum is approved by voters in the region.

True Affordability: Housing + Transportation Costs

Housing affordability is typically defined by the federal government as consuming 30 percent or less of a household's annual income (HUD, 2011). Housing that costs significantly more than this severely limits the remaining income to spend on food, health care, and other basic necessities, especially for low and moderate income families. The Joint Center for Housing Studies of Harvard University publishes an annual State of the Nation's Housing report which includes an assessment of housing affordability. For 2009, the most recent year with available data, 19.4 percent of all households spent between 30 and 50 percent of their income on housing. This equates to 22 million households that were considered moderately cost burdened. Another 17.1 percent, representing 19.4 million households, spent more than half their income on housing and were considered severely cost burdened. These numbers are up 23.8 percent and 38.2 percent respectively since 2001 and represent a significant challenge to affordable housing policy. Delving further into these numbers reveals that 22.5 percent of renters were moderately burdened and 26.1 percent were severely burdened, together representing more than 18.8 million renter households in the United States.

In recent years there has been growing recognition that true affordability must go beyond this one-dimensional definition to include transportation costs. For many households, transportation costs can rival and even exceed the cost of housing. Lipman (2006) found that, for working families in 17 of 28 metropolitan areas in the country, average transportation costs are as high or higher than housing costs. For example, working families in Atlanta making between $20,000 and $50,000 annually spent 29 percent of their income on housing, just below the typical definition of affordability, but spent 31 percent on transportation costs. The accepted benchmark for housing and transportation costs combined is 45 percent of a household's

income (Litman, 2011b), so Atlanta's 61 percent is well above that limit. In an earlier study, Lipman (2005) found that when considering housing and transportation costs together, the percentage of working families spending more than half their income was an astonishing 44.3 percent.

Given this relationship between housing and transportation costs, one strategy that is being promoted is transit-oriented development (TOD). It is commonly defined as higher density, mixed use development located within walking distance of transit, typically about one-half mile (Center for Transit Oriented Development [CTOD], 2011). It is presumed that households living in these areas will spend less on transportation because they can utilize public transit more frequently. A 2004 study by the Center for Transit Oriented Development found that people living in transit zones around stations commuted by car less frequently than the regional average, but that the magnitude of the difference depended largely on the age and extent of the transit system. In cities with medium sized or recently built systems, 77 percent of residents in transit zones commuted by car. This is compared to 65 percent in cities with large or more established systems and 83 percent in the 27 regions studied overall.

However, there is also a documented "transit premium" for housing in many of these accessible locations due to the proximity of convenient public transportation (Wise & Scire, 2009). Although the magnitude of the increase differs depending on the study and the variables analyzed (and even between different locations within the same system), this higher cost can offset any gains made from more affordable transportation. Wise notes that higher land and housing values tend to limit the number of affordable units available to lower income households, and can even affect subsidized units if the increase in rent is greater than can be covered by programs like housing choice vouchers (p.14).

If housing near transit is to be a viable option, there must be ways to encourage its creation and maintain its affordability. To begin with, however, a significant amount of federally assisted housing already exists near transit. Much of it faces expiring affordability requirements in the short-term, however, and in locations where demand has driven market rents higher the ability to maintain affordability is jeopardized (Haughey & Sherriff, 2010).

In a study of 8 major cities, Reconnecting America and the National Housing Trust found that over 100,000 federally assisted units are near transit, but that 63 percent of these units have contracts expiring by 2012 (National Housing Trust, 2007). Another study by the AARP identified a total of 400,000 federally assisted affordable units in 20 cities, of which more than 250,000 are located within a half-mile of transit. However, approximately 69 percent of these units have contracts expiring by 2014. In Atlanta, 53 percent of its affordable housing is located within a half-mile of transit, but 63 percent of these units will expire by 2014. In Denver, 75 percent of the region's affordable housing is located within a half-mile of transit, but 60 percent of those units face expiration in that period. Charlotte has 95 percent of its transit-accessible units facing expiration in that period and San Francisco has over three-quarters of its transit-accessible units in the same situation (Harrell, Brooks, & Nedwick, 2009). These

statistics underscore the importance of both preservation and new construction of affordable housing near transit.

To summarize, housing and transportation costs must be taken together when evaluating affordability for low and moderate income households. Subsidized units located far from transit can no longer be considered as affordable when considered in this light. TOD is one strategy to address the issue, but preservation of existing affordable units must also be a part of any effective approach to the problem.

Housing Location and Access to Employment

Another branch of research focuses on the link between housing and access to employment opportunities. Two dominant theories for studying this relationship exist: spatial mismatch theory and jobs-housing balance. Researchers in this field debate the merits of each concept, and these issues are the next focus.

Since the 1960's, the spatial mismatch hypothesis has been a primary frame for examining issues of accessibility to employment opportunities and time spent commuting from home to work. It posits that inner-city poverty is the result of residential segregation and a growing separation between employment opportunities and housing, among other factors (Blumenberg & Manville, 2004). In studies of specific metropolitan areas, researchers found greater mismatch in large cities than in small cities, in those with highly segregated neighborhoods than those with more racially diverse settlement patterns, and in areas where the largest share of entry-level job growth occurs in the suburbs instead of the central city (Sawicki & Moody, 2000).

Several studies have confirmed that transportation is a barrier to employment among the poor (see Blumenberg & Manville, 2004, 183). Sanchez (1999) supports this in his study of labor force participation in Atlanta and Portland, finding that public transit access is an important factor in determining the average rates of participation. Sawicki and Moody (2000) conclude that although there are structural barriers and personal characteristics that also limit employment opportunities for the poor, transportation is a more accessible policy lever than many other factors. As one example, transit oriented development can be an effective means of better connecting low and moderate income households to job opportunities that they may not otherwise have access to (Grady & LeRoy, 2006). New development can link existing job centers to housing or can create new jobs and housing within station areas.

However, there are several criticisms of the spatial mismatch theory that merit discussion. One criticism is that racial discrimination, and not distance to jobs, is the primary reason for inner city unemployment (Blumenberg & Manville, 2004). However, race and place are intertwined in complex ways and cannot be completely separated. Place, especially the inner city, can be representative of race in many locations as a result of segregated settlement patterns. A second criticism is that modal mismatch is increasingly important, particularly in newer cities that are more automobile-oriented (Blumenberg & Manville, 2004). In these cities,

access to a car allows residents to travel greater distances to employment locations but puts those without reliable automobile access at a severe disadvantage. This divergence of access due to travel mode is something traditional spatial mismatch theory disregards. Skills mismatch, which encompasses disparities in education and both hard and soft skills, is an important barrier that is often unaddressed as well.

Improving transit accessibility to jobs is not seen as the panacea for greater employment among lower income groups by everyone. Chapple (2006) argues that while increasing accessibility provides many benefits to metropolitan regions, improving employment opportunities for disadvantaged residents is not a significant one. She would classify TOD as a mobility strategy, one of three policy prescriptions to overcome spatial mismatch that she describes, and notes that public transit does not improve employment outcomes as much as auto ownership does. Instead, she advocates for diverse bridging networks and workforce intermediaries to help low income populations connect with job opportunities. Likewise, Blumenberg and Manville's (2004) review of studies linking employment to transportation finds only weak statistical relationships between them. They conclude that transit strategies should focus on two approaches: improving inner-city accessibility among existing high density housing and job centers (rather than relying on radial routes to the suburbs), and creating demand-responsive services similar to existing paratransit that better serve transit riders' individual needs compared to fixed routes. Expanding transit service hours and designing better connections between different transit routes and service providers could have a significant positive impact on residents in inner-city locations.

Jobs-housing balance is closely related to the spatial mismatch hypothesis but focuses more on land use and physical proximity rather than accessibility via transit. Whether a person walks or drives a short distance to travel between home and work is largely irrelevant in the jobs-housing universe. That is, the concept is "primarily locational rather than modal" (Levine, 1998, p. 133). The core of the jobs-housing balance approach is that suburban land use regulation constrains the housing location choices available to workers, especially near job centers. This limits the availability of units for workers who value that proximity, and instead forces them to seek housing further away and endure a longer commute to get to their place of employment. Providing more housing options near employment allows workers who prefer that lifestyle to be able to make that decision freely. An important corollary is that jobs-housing balance is not about congestion mitigation as many critics claim. Crafting jobs-housing policies as congestion mitigation strategies sets them up for failure when increased capacity on roads is quickly filled by new demand, only worsening the problem that first existed.

Levine points out several arguments used against the jobs-housing balance concept. One is that its measurement depends greatly on the geographic extent considered, and that with no common limitation such measurement can be arbitrary. Another is that the concept is based on single-worker households in long-term employment situations, an increasingly less common scenario as two-worker households and job mobility increases. Finally, critics state that

jobs-housing balance depends on large numbers of workers accepting less housing (ie smaller units and yards) to be closer to work instead of more housing further away, a choice that seems opposite the common trend.

A common facet of the housing and employment relationship in these two theories is the commute time between home and work. Public transit is promoted as an alternative to private vehicles but the commute time via transit is often significantly longer than by car. Shen (2001) uses a 30-minute commute time threshold in his study of job openings and access in Boston. He finds that job seekers willing to travel up to 30 minutes by car had relatively high accessibility levels as long as they did not live in the exurbs, but those constrained to a 30 minute commute by public transit had access to significantly fewer opportunities. In both scenarios, those residing in central city locations had slightly better accessibility than those living farther out on the periphery. Lipman (2006) finds that single working parents in Atlanta's central city face commute times to suburban jobs that are almost twice as long by transit as by car, causing a variety of detrimental impacts for childcare logistics and overall quality of life.

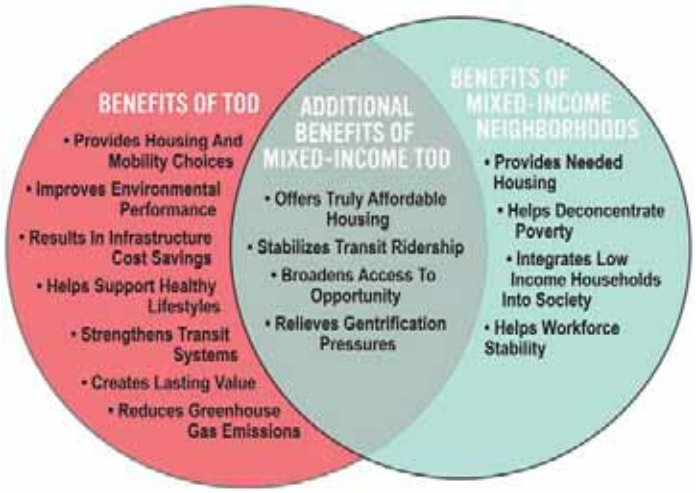
As can been seen from the literature, housing accessible to transit facilitates greater connections to employment opportunities (in addition to services, entertainment, and other daily needs) but the strength of this relationship is still debated. While transit can be part of a comprehensive strategy to improve employment outcomes for low and moderate income households, relying only on transit-oriented development is inadequate to address the complexity of the problem. Fostering the creation of bridging networks for low income households and providing better workforce intermediaries are two recommended policy approaches to complement the benefits of TOD.

Making the Case for Mixed Income Transit Oriented Development

Transit oriented development has been discussed as one strategy to address rising housing and transportation costs. Mixed income TOD (MITOD) includes a specific emphasis on affordable and workforce housing within transit-accessible locations. Doing so counteracts the trend towards higher income housing in many TOD locations that prevents lower income households from realizing the benefits of transit (Soursourian, 2010). As shown in Figure 1, MITOD can also help to alleviate gentrification pressures in up-and-coming neighborhoods around new transit stations and attempt to create bridging networks for low and moderate income families, helping to address some of the criticisms of mobility strategies outlined previously.

Mixed income communities are associated with a number of benefits for low and moderate income households. The four benefits most often promoted are categorized as improved social networks (or social capital), social control (or social organization), behavior (or role modeling), and political economy of place (Joseph, Chaskin, & Webber, 2007). Social networks refer to interpersonal relationships that can help low income residents gain access to information and job opportunities they would not have otherwise. Social control describes how

Fig. 1 - Benefits of Mixed-Income TOD (Source: CTOD, 2009b)



the presence of higher income residents is often associated with improved social organization that helps recognize shared values and promote order and safety. Behavioral benefits are linked to social learning; that, by being around residents from more stable backgrounds who model productive behaviors, lower income residents can break out of the culture of poverty associated with predominantly disadvantaged neighborhoods. Finally, political economy of place argues that higher income residents have more political and civic connections and can lobby external actors for better services for the community as a whole. This is distinctly different from the first three benefits as it is based on the community's relationship with outsiders via political action and civic involvement rather than on relationships among residents.

Evidence supports improved social organization and better neighborhood qualities as the most typical short-and middle-term outcomes of mixed income communities (Joseph et al., 2007). Social networks are dependent on meaningful interactions between members of different income classes, which are not always robust, and role modeling is criticized as being paternalistic and most likely to occur only between children and adults, not peer to peer. The benefits of social organization and political economy of place rely less on these social interactions among residents and more on outside relationships that benefit the entire community and thus indirectly benefit low income residents.

Depending on the relative weight given to each proposition by the supporters of a mixed income effort, the expectations will be different and outcomes should be measured appropriately. For example, if fostering meaningful social interactions between residents is important then the design of public spaces and creation of community events can play a significant role in the extent to which this actually occurs. In Joseph, Chaskin, and Webber's final analysis, they determine that the expectations for the direct benefits of mixed income communities to low income residents should be scaled back but that the method merits further exploration as one tool to improve the plight of low income households (2007).

Mixed income communities in the context of transit oriented development are often promoted as providing truly affordable housing, broadening access to opportunities, relieving gentrification pressures, and stabilizing transit ridership (Thorne-Lyman, 2011). They can connect workers to jobs, create new jobs, and bring investment to economically depressed areas (Soursourian, 2010). Some of these benefits accrue from physical location and transit connections and others from the residents living in them. Whatever the source, the benefits of MITOD are attractive to many people and indicate a growing and sustained demand for these types of locations.

The Center for Transit Oriented Development (2009) predicts that 25 percent of new households by 2030 will prefer transit oriented locations, representing an increase from 6 million to 15 million households. Of this demand, over 40 percent will be low income (less than 80 percent AMI) or very low income (less than 50 percent AMI) households, emphasizing the need for affordable housing near transit. MITOD can accommodate this within communities that also bolster access to employment opportunities and seek to improve the quality of life for all residents.

A 2004 study by the Center for Transit Oriented Development describes several important trends behind this predicted demand. Foremost are changing demographics and market preferences. Household size is steadily shrinking in the United States and the number of Baby Boomers is growing. These small households and seniors are expressing a greater desire for small lots, convenient activities and services, and accessible transportation options than previous groups have. AARP reports that 71 percent of senior households want to be able to walk to transit (Harrell et al., 2009). Immigration is another demand factor, as many new residents are accustomed to using transit and prefer to continue that aspect of their lifestyle in the U.S. In addition to these trends, real estate professionals are recognizing the value in transit oriented development and seeking out more of these investments.

Policy Tools

While the demand for TOD is high, the supply is insufficient and the creation of mixed income communities in these areas is even less prevalent. The appreciation of land values near new transit projects often drives low income residents out while increasing development costs and making it difficult to provide affordable housing in new projects (CTOD, 2009a). In many transit areas, incoming households are more likely to have higher incomes than the original residents, more likely to own a car, and more likely to commute alone, thus failing to capture the maximum benefits of living near transit (Pollack, Bluestone, & Billingham, 2010). Policies to support MITOD in sufficient quantities will require careful tailoring to a region's unique needs. The MITOD model is not one that can be applied uniformly in every situation but is a tool that should reflect local characteristics and priorities. The success of these areas should be judged not by national standards but on how the neighborhoods surrounding them experience the benefits associated with this type of development (Brooks, 2010).

A variety of tools exist to support MITOD. Among these are planning and zoning tools like incentive-based zoning, parking reductions, and station-area planning; financing tools like housing incentive programs, tax increment financing, and the Low Income Housing Tax Credit program; and transportation management programs like car sharing and unbundling the price of parking (Kniech & Pollack, 2010). Planning tools can be effective at anticipating potential problems that might arise from TOD and seek to mitigate them ahead of time. Financing tools focus on the neighborhood changes that can occur with development and provide resources for land acquisition, preservation, and new construction of affordable housing. Transportation management programs appeal to core transit users with pedestrian-friendly TOD environments that allow living car-free if desired.

Joint development is another policy tool gaining popularity due to the increased ridership it produces, the mitigation of displacement around new station areas, and the role of affordable housing in the initial lease-up stage (Shoemaker, 2006). In Kniech & Pollack's survey of 24 transit agencies nationwide, at least 9 have specific joint development policies with affordable housing components while the remaining rely on relationships and expectations to produce these projects. The Atlanta Beltline Affordable Housing Trust Fund, Charlotte CATS Affordable Housing Transit Policy, and Denver RTD's TOD Strategic Plan are three such policies (Kniech & Pollack, 2010). The BeltLine Affordable Housing Trust Fund has set a goal of 5,600 affordable units near the 22-mile redevelopment corridor. Charlotte's policy requires 5 to 25 percent of units within a half-mile of transit to be affordable, and limits the number of assisted units to less than 20 percent of the total within a quarter-mile. Denver's policy was developed in conjunction with the FasTracks transit expansion program in the region and coordinates regional housing needs with TOD near the new stations.

Previous Studies of Affordable Housing Near Transit

Atlanta's Mixed Income Communities Initiative (MICI) commissioned a study assessing the need for affordable housing near transit and its relation to existing job centers (Bernstein, 2004). This study of the ten-county metro area found an oversupply of housing for mid- to upper-income households and a shortage of units affordable for households earning less than $40,000 per year. It cites the high cost of transportation in Atlanta as a hidden expenditure for households and businesses, and advocates for comprehensive policies addressing housing, jobs, and transportation costs in the region. Finally, it promotes the development of mixed-use and mixed-income communities near transit as the key to maintaining investment in the region, preserving quality of life, and growing the economy.

A particularly relevant map contained in this study shows target areas for additional housing near MARTA rail, proposed BeltLine and commuter rail routes, and sites of Livable Centers Initiative studies (Bernstein, 2004, p. 59). This map used quarter-mile, half-mile, and one-mile buffers around transit stations and a quarter-mile buffer along transit lines to generate an accompanying table which lists total households, residential acres, current average net

households per acre, and the additional number required to reach seven households per acre (determined a "feasible target density") for each buffer.

Sawicki and Moody (2000) studied welfare recipients in Atlanta and their access to entry level jobs. Their findings are relevant to establish a basic framework of employment in the metro area. They showed that 50 percent of the nearly 100,000 welfare recipients in the city live within a half-mile of a transportation line and that 44 percent of regional entry-level jobs are located within that same distance. While almost three-quarters of the region's entry-level jobs are located outside the I-285 perimeter on the north side of Atlanta, the single largest concentrations of such jobs is readily accessible by transit in downtown Atlanta.

Pollack, Bluestone, and Billingham (2010) studied neighborhood change between 1990 and 2000 around 42 new stations in 12 metropolitan areas. They defined a "transit rich neighborhood" as a half-mile radius around each station and included block groups that had a majority of their land area within that distance. They examined a variety of data points, including population, housing units, household income, housing costs, in-migration, public transit use, and car ownership, and aggregated the data at the station level. They conducted a three-stage analysis comparing the transit-rich neighborhoods to their MSAs to reach their final conclusions about change likely caused by the new station.

The Center for Transit Oriented Development (2004) gathered demographic data to integrate into a GIS model of transit systems in the United States. They defined the transit zone around stations as a half-mile buffer in order to determine the effects of transit on housing prices. To calculate residential density, they used Census block-level data and only included the acreage of blocks with at least one resident. The end result was four specific TOD characteristics: average residential density, average block size, average miles to CBD, and average year the housing units were built. These in turn informed the development of six transit zone typologies that organized the analysis of demand for housing.

Data Sources

Three primary sources provided housing and jobs data for this analysis. Census 2010 data provides basic statistics for housing, vacancy, and household population at the block level. American Community Survey (ACS) Five-Year Estimates for 2006-2010 provide block group data on rent levels and housing burden but have relatively high margins of error. This geographic resolution of data is the best available for the small-area studies around MARTA stations and the TIA transit corridors, but should be interpreted carefully before drawing definitive conclusions. Local Employment Dynamics (LED) data from 2009 is the source for jobs data at the block level for Worker-Area Characteristics (WAC), corresponding to where jobs are located, and Resident-Area Characteristics (RAC), corresponding to where workers live.

Information about the proposed station locations along the TIA transit routes had to be gathered from several sources because these locations are not included in the Project List documentation. Instead, station locations for the Clifton Corridor and I-20 transit line are taken from the selected alternative analyses conducted by MARTA – LRT1 for Clifton Corridor and HRT3 for I-120 (S. Lewandowski, personal communication, February 29, 2012). The stations on the I-75 enhanced transit line are taken from the 2001 Transit Implementation Study for the Northwest Corridor Light Rail Transit System. The MARTA North Line extension stations are identified in Plan 2040 completed by the Atlanta Regional Commission (ARC). The Piedmont Road/Roswell Road bus rapid transit (BRT) line has not identified stations yet and so was divided into roughly one mile wide segments to provide a better level of spatial detail than the entire corridor. The two Beltline/Streetcar projects are analyzed at the corridor level since stop locations have not been proposed yet and because they will be much closer together than the station locations for light rail or bus rapid transit.

Methodology

Once the housing and jobs data had been procured and cleaned, the tables were joined to Census shapefiles for analysis. A multi-ring buffer was created around the MARTA stations and TIA transit lines using quarter-mile, half-mile, and one-mile radii. The analysis of the station buffer areas utilized the intersect function in ArcGIS 10 to combine these transit zones with housing and jobs data, the attribute query tool to sort by buffer distance and other relevant criteria, and the summarize function to create new tables. Thematic maps were then generated to visualize housing and employment statistics and land availability.

The three buffer distances are based on research about transit-oriented development and the typical transit zones in which people commonly use transit. A quarter-mile radius corresponds to a comfortable 5-minute walk for the average person, a half-mile radius is considered the zone of influence within which people are most likely to utilize the system, and

a one-mile radius represents a reasonable distance to bike or provide frequent connections via shuttles or public buses (URS, 2006).

The density classifications for the housing and employment maps are based on the Institute for Transportation Engineers' (ITE) 1989 report *A Toolbox for Alleviating Traffic Congestion.* This report synthesizes several earlier studies of density around transit including Pushkarev and Zupan's seminal 1977 study. Those authors recommended thresholds of 4 units per acre for minimum bus service operating once an hour, 9 units per acre for light rail transit, and 12 units per acre for heavy rail. More recent research has indicated that these may be too low to effectively change demand for transit usage, so current ITE thresholds are slightly higher. Pushkarev and Zupan's minimum bus threshold is maintained but the light rail threshold increases to 35-50 units per acre. ITE also adds two intermediate levels of bus service, recommending 7 units per acre to support 30-minute headways and 15 units per acre to support 10-minute headways.

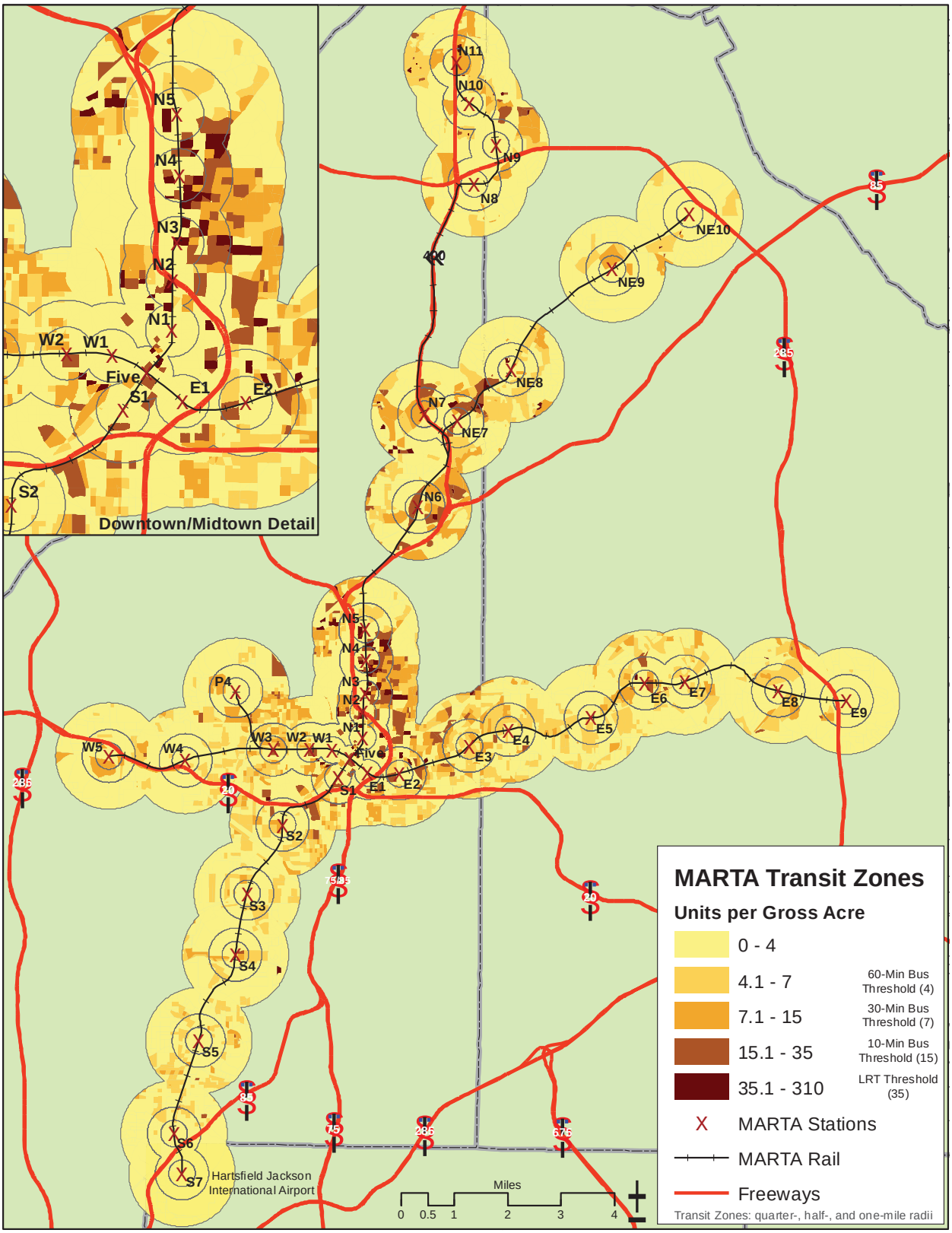
Proximity of jobs to transit has also been demonstrated to be an important determinant in the level of transit usage for daily commute purposes. The ITE report recommends employment density thresholds of 50 jobs per acre for minimum bus service and 500 jobs per acre for light rail transit service.

The jobs analysis focuses on both total jobs and on low-skill jobs and workers. Information on low-skill workers comes from LED data using the low-income category (those earning less than $1,250 per month, or $15,000 per year) as a proxy for low skill levels. While this is admittedly an imprecise comparison, it is the best that could be determined for the purposes of this study.

Findings and Analysis

The analysis is broken down into three sections: existing MARTA rail stations, proposed TIA transit routes, and MITOD opportunities. The MARTA and TIA sections discuss the findings about current housing and job characteristics to provide insight into where shortages, imbalances, or surpluses exist to inform policy makers and development professionals. The MITOD opportunities section discusses recent housing vacancy rates and the amount of undeveloped land in the MARTA and TIA transit zones to identify reuse possibilities and the physical availability of land for development. A series of maps precedes each section and are analyzed in the subsequent text. Additional maps and tables are included in an appendix.

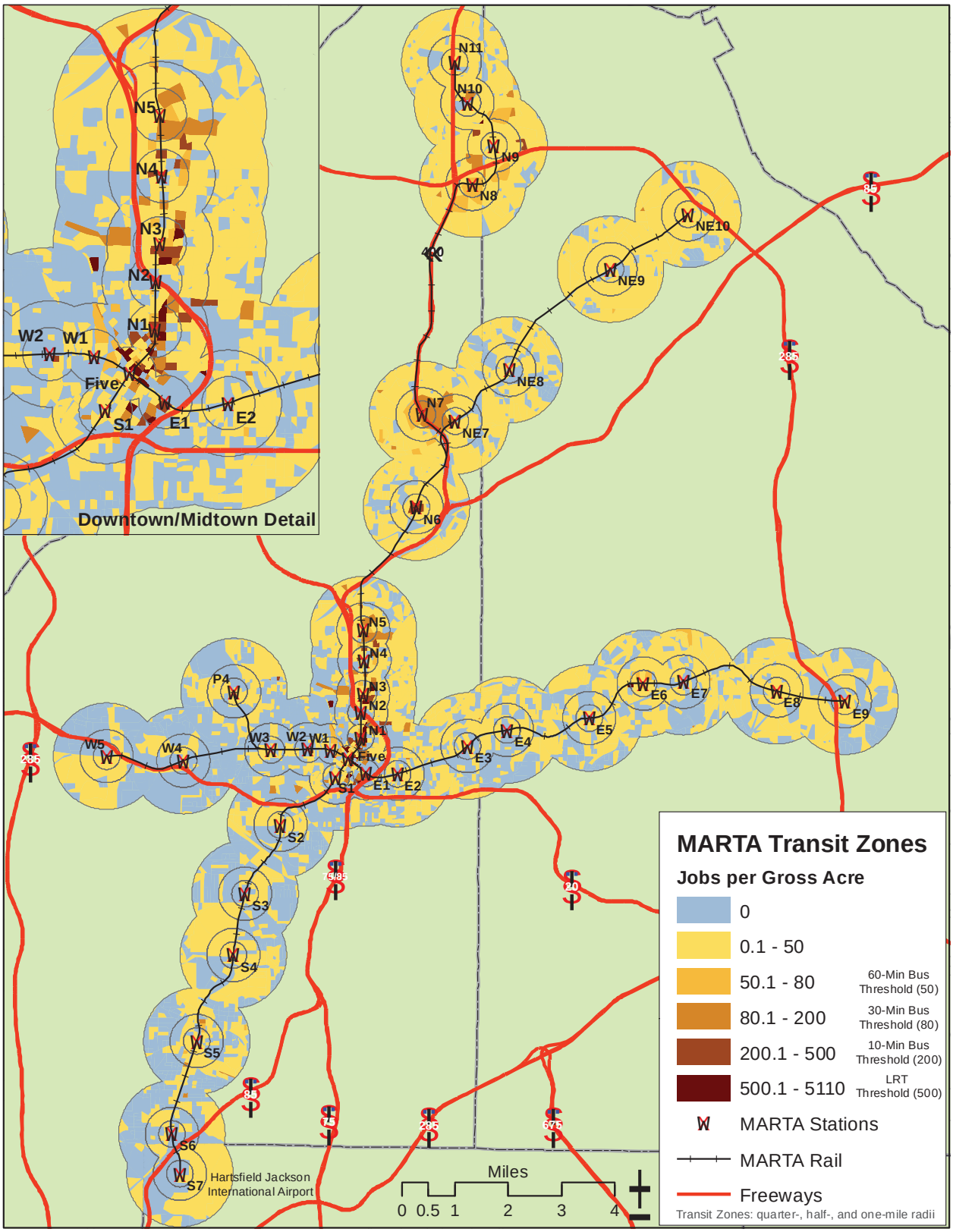
MARTA Rail: Housing Density (2010)



Map 1: MARTA Housing Density

MARTA Rail: All Transit-Accessible Jobs (2009)

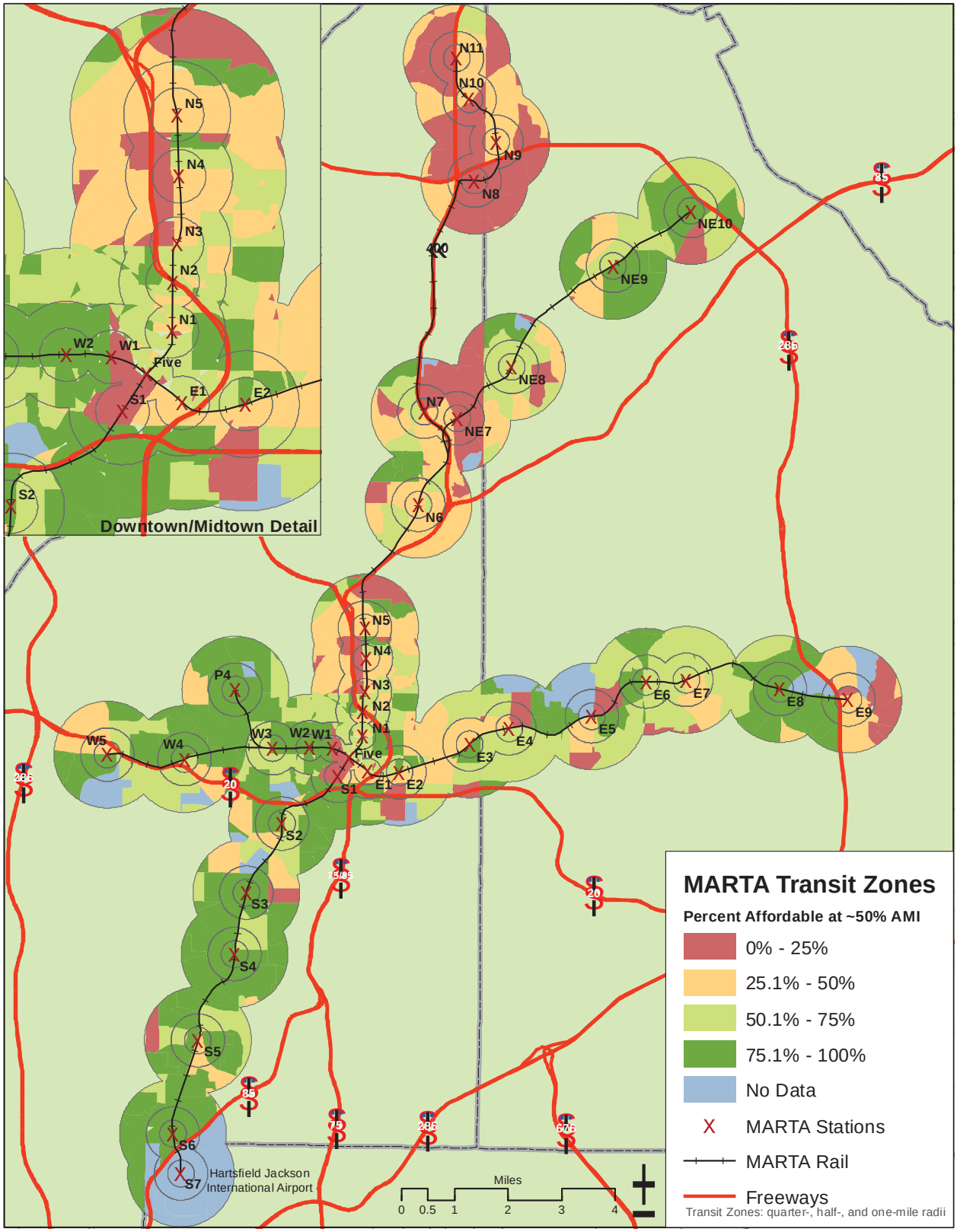
Where the Jobs Are



Map 2: MARTA Employment Density

MARTA Rail: Affordable Rental Housing (2010)

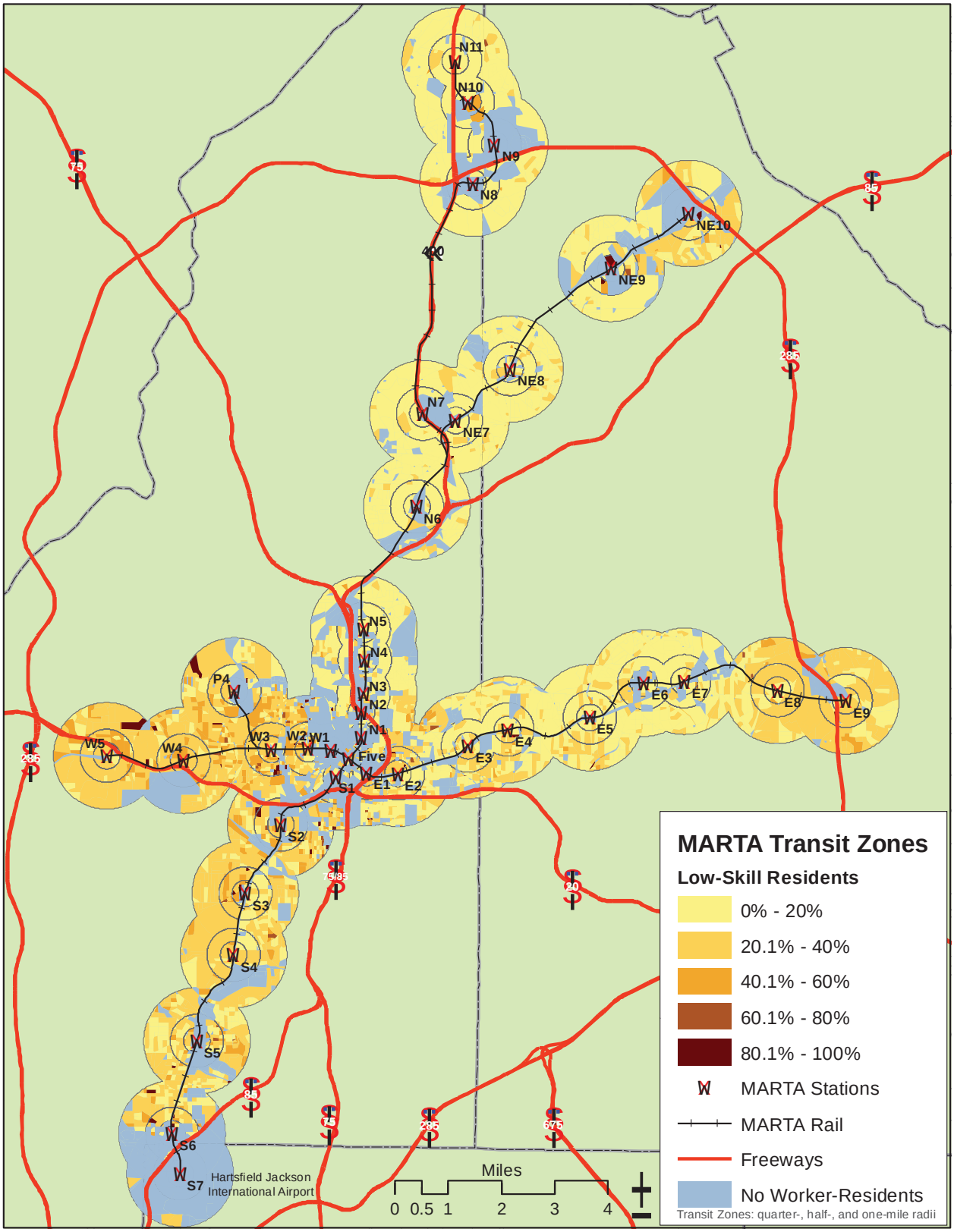
Rent < $999/mo
56% AMI



Map 3: Affordable Housing Near MARTA

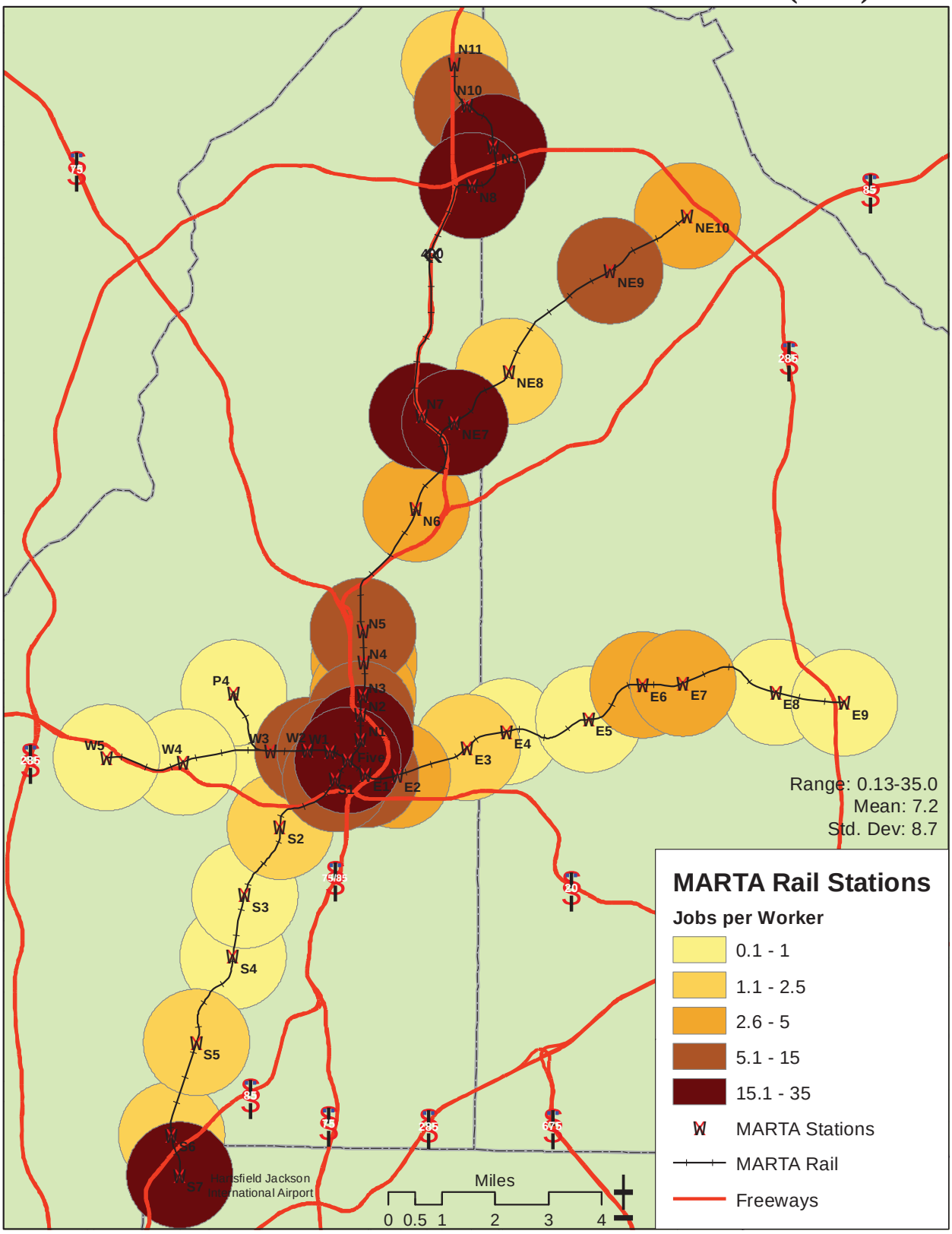
MARTA Rail: All Low-Skill Workers (2009)

Where Workers Live



Map 4: Low-Skill Workers Living Near MARTA

MARTA Rail: Low-Skill Jobs to Low-Skill Workers Ratio (2009)



Map 5: Low-Skill Jobs to Workers Ratio Near MARTA

MARTA Rail Stations

The MARTA rail system has been in existence since 1979 when portions of the East line (now the Blue line) first opened for service (MARTA, 2009). Growth was rapid in the 1980's and early 1990's, with the two most recent stations opening in 2000 at Sandy Springs and North Springs to bring the total to 38 stations. The Lindbergh Center TOD, a partnership between MARTA and BellSouth that created the first planned TOD in the system, opened its first phase in 2002. Recently, TOD studies have been initiated at the Edgewood/Candler Park, Kensington, College Park, and East Point stations (J. Lombard, personal communication, October 26, 2011).

Housing and Job Density

Map 1 shows existing transit-supportive densities in three primary areas: Downtown/ Midtown east of I-75/85, the Lindbergh Center/Buckhead/Lenox area, and the four stations at the end of the Red (north) line. Densities around the stations south of Five Points are the least transit-supportive of the four branches. The Midtown station has the greatest number of housing units within each of the three transit zones, followed closely by the North Avenue and Civic Center stations. This translates to almost 21 units per acre within a quarter-mile of the Midtown station and about 9 units per acre within a mile of the station[1]. Overall, the MARTA system has an average housing density of just under 4 housing units per acre within each of the three transit zones, well below the MICI-targeted goal of 7 units per acre within transit zones to support more opportunities for MITOD. ITE recommendations suggest that even this is still a low target for a heavy rail system like MARTA.

Not surprisingly, the downtown stations have the greatest number of jobs nearby. Five Points station has the most jobs within a quarter-mile with over 39,000, or almost 315 jobs per acre, and has over 106,500 jobs within a mile for a density of 50 jobs per acre (Map 2). Peachtree Center station has the most jobs within a mile with over 131,500 jobs and a density of 65 jobs per acre. System-wide, average job density increases from 18 jobs per acre in the one-mile transit zone to 36 jobs per acre in the quarter-mile transit zone. While these figures are well below the ITE recommendations, other research suggests that an employment density of 25 jobs per acre can support basic transit and 50 jobs per acre can support more intense transit like light rail (Transportation Cooperative Research Program [TCRP], 2004).

These findings indicate a need to increase densities around stations to connect more housing and job opportunities while improving the efficiency of the transit system. Infill development will provide new opportunities for MITOD to increase the supply of affordable and workforce housing accessible to transit. The next aspect of MITOD to consider is the existing housing affordability and low-skill employment densities that will assist in understanding where these opportunities exist.

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1 Housing and employment density is measured in units or jobs per gross acre throughout the study.

Rental Housing Affordability

The federal government classifies households that earn less than 50 percent of area median income (AMI) as very low income, and those that earn less than 80 percent of AMI as low income or workforce. For housing to be considered affordable, the literature states that no ore than 30 percent of household income should be dedicated to housing costs. Since metro Atlanta's AMI was $71,800 in 2010, a truly low income household could afford rents less than $900 per month and a workforce household could afford rents of up to $1,435 per month.

This study indicates that there is a shortage of affordable housing in many areas near MARTA stations but a more adequate supply of workforce housing. The system exhibits stark differences in affordable housing shares between the four lines as seen in Map 3. The north line has the lowest percentage of affordable housing units while the south and west lines have the highest percentages. Chamblee and Doraville, the last two stations on the northeast line, have much higher percentages than the north line stations, and the east line has clusters of both high and low percentages. Affordable rental units comprises less than half of the total rental stock within the quarter-mile transit zone of 14 stations, and the same within the one-mile transit zone at 9 stations. Those north of and including Lindbergh Center stand out in this category. On average, 60 percent of all housing units within a quarter-mile of rail stations are considered affordable and 90 percent are considered workforce.

Low-Skill Workers and Jobs

Comparing the place of residence for low-skill workers to the location of low-skill jobs provides an indication of potential accessibility synergies. The highest concentrations of low-skill workers live along the south and west lines where about 30 percent of the working population fits this description (Map 4). North Avenue station has the highest number of low-skill workers within a quarter-mile, with 200 residents representing 15 percent of the total working population there. Oakland City and H.E. Holmes have the highest percentage of such workers with around 35 percent each. In the one-mile transit zone, North Avenue again has the highest number of resident low-skill workers with almost 1,800. Other clusters of low-skill residents exist around the Doraville and Sandy Springs stations on the northeast and north lines respectively, and around the last two stations of the east line. These findings support the popular perception that lower-skill residents tend to live further away from the core, and to the west and south of downtown.

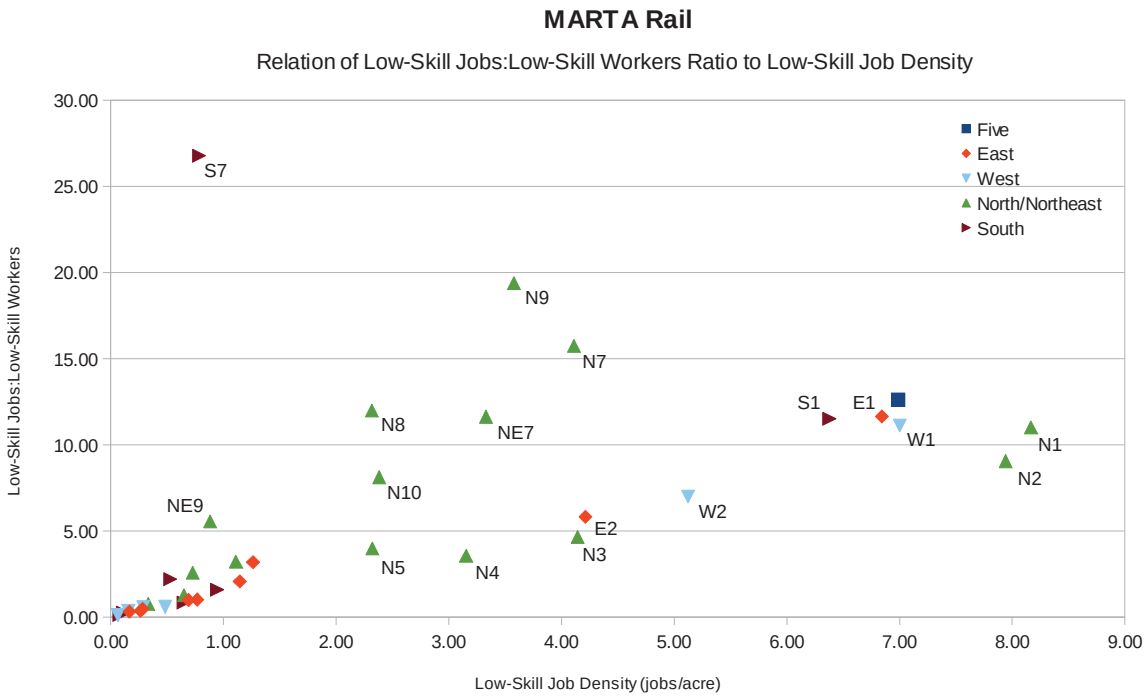
Five Points has the highest number of low-skill jobs within a quarter-mile, representing 15 percent of all jobs in that transit zone. This likely reflects the high number of service and hospitality jobs in the tourism industry downtown. Ashby has the highest percentage of these jobs at 58 percent, followed by Indian Creek and Inman Park-Reynoldstown. In the one-mile transit zone, Peachtree Center station has the highest number of low-skill jobs, representing 12 percent of all jobs there, and Indian Creek has the highest percentage with 43 percent. Together, the jobs near Five Points and Peachtree Center provide many opportunities for the

concentration of low-skill workers at the nearby North Avenue station as well for workers throughout the MARTA system.

An analysis of two different ratios provides a better understanding of the links between housing and jobs:

- The ratio of low-skill jobs in a transit zone to low-skill workers living there provides an indication of whether employees can live near their work. A ratio well above one represents a large number of jobs but relatively few workers living nearby, while a ratio below one indicates an area with many resident-workers but few job opportunities. The ideal ratio of one provides job and housing opportunities in equal numbers, potentially reducing commute times and the expense of personal transportation. The target range is anywhere between 0.8 and 1.25 to 1.0 (Cervero, 1996 cited in Weitz, 2003).
- Jobs-housing balance is another measure of the location of housing near employment opportunities. The ideal ratio of 1.5 jobs per housing unit presumes many two-worker households. The target range is between 1.3 to 1.7 or 1.4 to 1.6 (Ewing, 1996 & Cervero, 1991 cited in Weitz, 2003). This balance indicates that there are sufficient opportunities for people to live near their place of work if they choose and if the rent and income levels are well-matched. This study is concerned with Type 1 and Type 3 imbalances. Type 1 indicates too many low-skill jobs and too few affordable units, while Type 3 indicates too few low-skill jobs and too many affordable units (Weitz, 2003, p. 5).

Figure 2: Job Density to Jobs-Workers Scatter Plot

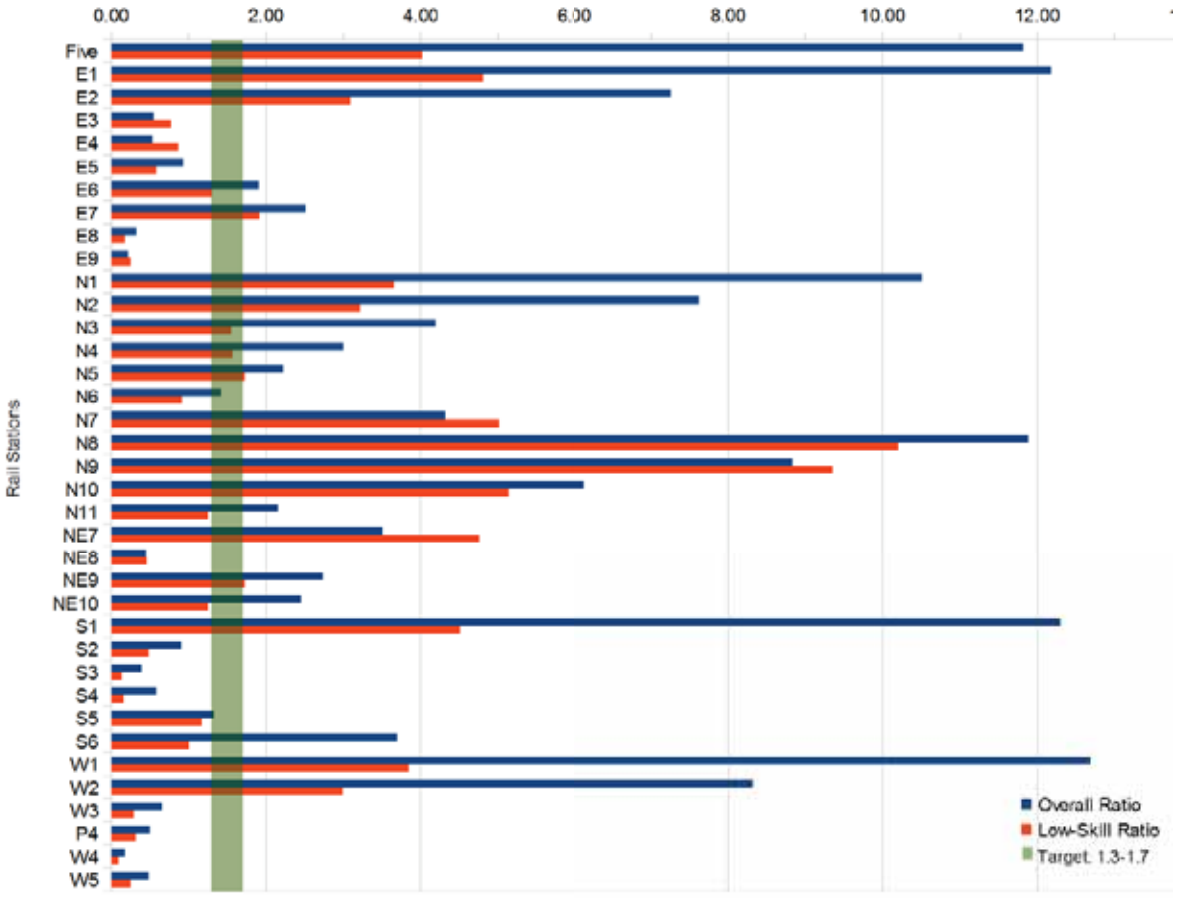


As shown in Map 5, the ratio of low-skilled jobs to low-skill workers is highest in the one-mile transit zone around the Airport at 27. Dunwoody, Buckhead, and Five Points are next with ratios of 19, 16, and 13 respectively. Chamblee station comes nearest the average of 5.6 low-skilled jobs per low-skilled worker, and Edgewood-Candler Park and Inman Park-Reynoldstown are the most balanced station areas. West Lake and Oakland City have the fewest low-skilled jobs per worker with ratios just above 0.10.

Figure 2 uses a scatter plot to explore whether any relation exists between low-skill job density (x-axis) and the ratio of low-skill jobs to low-skill workers (y-axis). One interesting feature to note is how the core stations including Five Points have values in the lower right portion of the graph. Second, the north and northeast lines stand out as having the largest spread of results compared to the cluster of other stations in the lower left of the graph. This reflects the commercial nature of the north line as it travels through the downtown CBD, Midtown, and Buckhead as compared to the other three lines and their lower density, more residential character.

Figure 3 compares the overall jobs-housing balance and the low-skill jobs to affordable housing units balance around each rail station. Analyzing the overall balance reveals similar patterns to the jobs-worker ratio. The Airport (omitted from Figure 3) is again a significant

Figure 3: MARTA Jobs-Housing Ratios



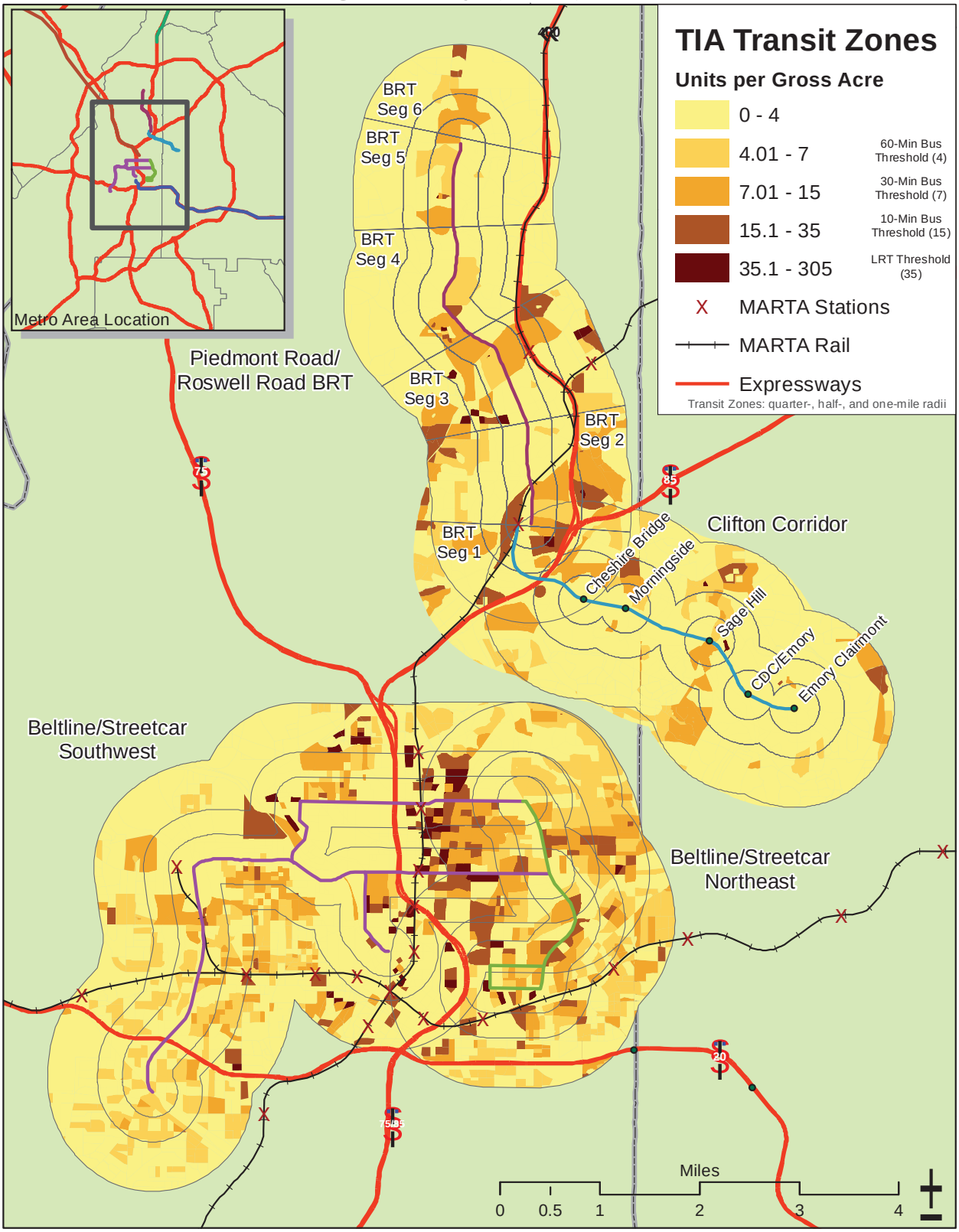
outlier with 85 jobs per housing unit in the one-mile transit zone, a severe Type 1 imbalance. The stations nearest Five Points have similar ratios of around 11 to 12 jobs per housing unit, while Medical Center on the North line has a similar Type 1 imbalance. Sandy Springs is again closest to the average value (6.2), although Buckhead is closest to the average when the Airport's value is omitted. Lindbergh Center, Decatur, and East Point are the most balanced, and West Lake and Indian Creek again have the lowest ratio at around 0.20 jobs per housing unit, indicating a Type 3 imbalance.

The ratio of low-skill jobs to affordable housing units maintains a similar pattern as the overall balance. The Airport is still an outlier but by a lower margin than the overall jobs-housing balance. Medical Center and Dunwoody stations have the next highest ratios at 9-10 jobs per resident-worker. Avondale is closest to the average value of 2.3, and North Avenue, Midtown, Arts Center, and Chamblee are the most balanced. West Lake, Oakland City, and Lakewood/Fort McPherson have the most severe Type 3 imbalance with around 0.10 low-skilled jobs per low-skilled resident-worker.

Analyzing each branch of the MARTA rail system reveals other interesting findings. In most cases, the overall ratios are higher than the low-skill ratios, indicating a better balance within the latter category. The north line and the stations closest to Five Points typically have the highest ratios, reflecting Type 1 imbalances in these areas. Interestingly, the jobs-housing balance of low-skill positions and affordable housing burdens is the ratio closest to one across all lines. It ranges from 2.7 on the south line, largely influenced by the Airport's high Type 1 imbalance, to 1.35 on the east line. Without the Airport the south line has a more balanced ratio of 1.85.

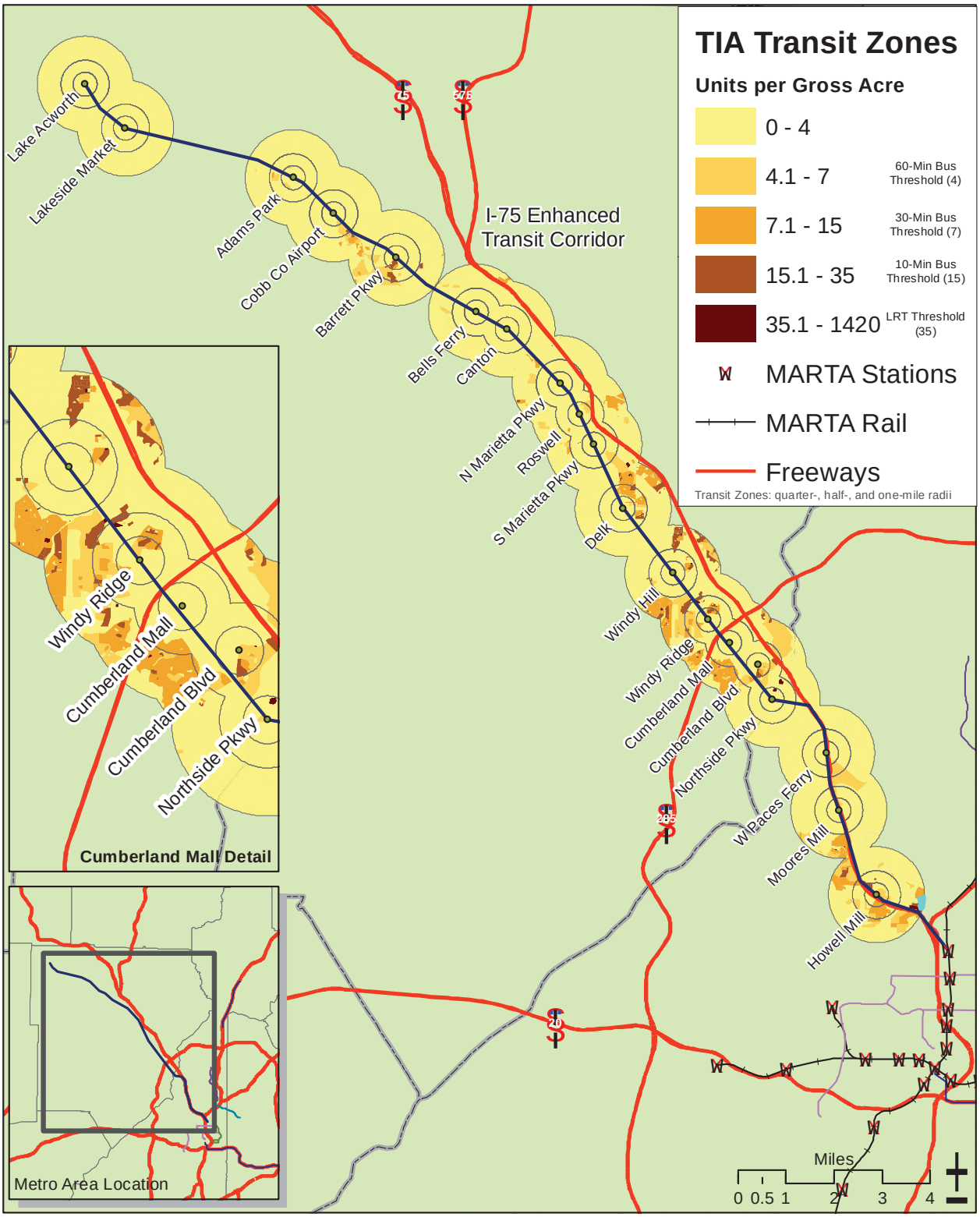
These ratios provide two different methods of assessing the housing and employment dynamics around MARTA rail stations. The stations with the highest ratios are major employment centers with relatively little housing nearby. The Airport station is an outlier for all these ratios because there are few housing opportunities near this major employer due to the nature of the airport's operations. Those at the opposite end of the spectrum are much more residential in character with fewer jobs available. The fact that several stations downtown consistently have high ratios indicates that infill housing development could place more employees near their place of work, especially if affordability is ensured.

TIA-Central: Housing Density (2010)



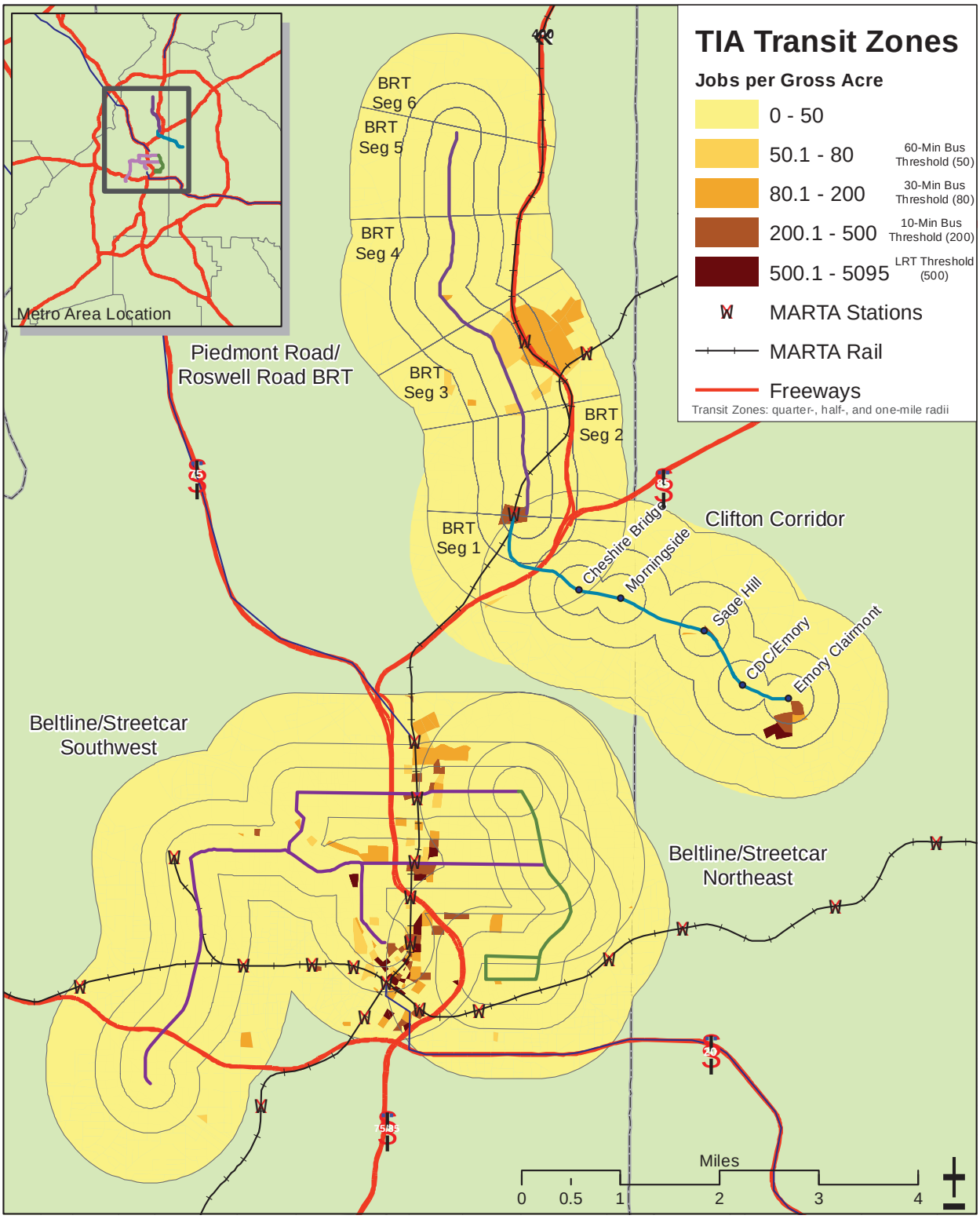
Map 6: Central TIA Housing Density

TIA-Northwest: Housing Density (2010)



Map 7: Enhanced Transit Corridor Housing Density

TIA-Central: All Jobs Near Transit (2009)



Map 8: Central TIA Employment Density

Proposed TIA Transit Projects

The Transportation Investment Act passed the Georgia state legislature in 2010, dividing the state into 12 regions that will each vote on a one-penny sales tax to fund a list of transit projects specific to the area. The Atlanta Regional Roundtable approved the project list for the metro region in fall 2011. The TIA reserves 85 percent of the projected revenue for the regional project list and 15 percent for locally determined uses. Of the regional funds for the Atlanta area, 51.5 percent of the amount is allocating to transit projects, 47.3 percent to roadways, and the remainder to bicycle/pedestrian, roadway/transit, and aviation projects (Atlanta Regional Commission, 2012).

Housing and Job Density

The housing density maps (Maps 6 and 7) help identify clusters of more transit-supportive densities. The Clifton Corridor and BRT line have denser areas around the Lindbergh Center station, the hub for both lines, and in segments 2 and 3 of the BRT line which roughly correspond with Buckhead. The Beltline/Streetcar Northeast project benefits from the same Midtown density that the MARTA system does[2]. The I-75 Enhanced Transit project has a cluster of higher density around I-285 near Cumberland Mall and also at Delk Road. Overall this project has a density of only 1.37 units per acre in the quarter-mile transit zone and 1.72 units per acre in the one-mile transit zone, making it the least dense corridor. The North line extension also has small clusters of relatively higher density in the western portion of the transit zones. Overall, the areas near the proposed transit lines do not currently exhibit transit-supportive densities in any significant amount and will require infill policies that encourage or require higher density development to make transit more viable.

Three projects come closest to achieving transit-supportive housing densities on average in the quarter-mile transit zone: the northeast Beltline/Streetcar project at 7.4 units per acre, the southwest Beltline/Streetcar at 6.2 units per acre, and the BRT corridor at 5.7 units per acre. It should be noted these projects also have the largest transit zones because of the corridor-level analysis. The North Line extension, the I-20 corridor, and the Clifton Corridor have the lowest average housing densities. The North Line and I-20 corridor have their alignments in or adjacent to a highway right-of-way which limits the housing opportunities nearby, while the Clifton Corridor project is routed through primarily low density, single-family areas. In the one-mile transit zone, only the northeast Beltline/Streetcar project surpasses the 7 dwelling units per acre transit threshold.

The I-75 Enhanced Transit Corridor serves the highest number of total jobs within both the quarter-mile and one-mile transit zones. The average number of jobs per station is slightly lower than along the Clifton Corridor however (Map 8). At a quarter-mile the Clifton

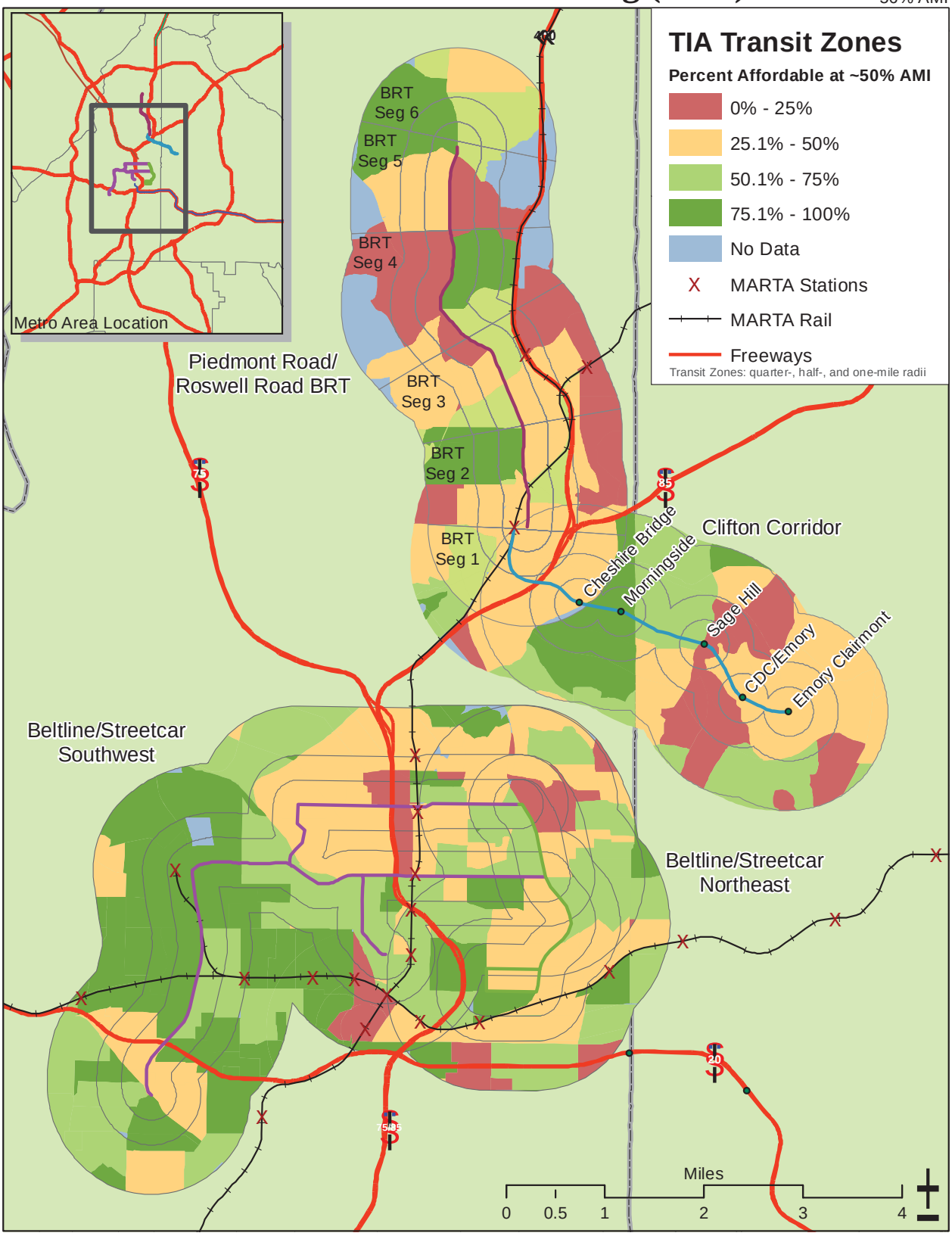
2 Because the Beltline/Streetcar projects and the BRT line along Piedmont Road and Roswell Road had no station information available, they were studied at the corridor level rather than station level. These transit zones are less comparable to the station-level zones because the corridor data is drawn from a much larger area. General comparisons about densities and ratios can be made, but comparing the number of jobs or housing units would be inappropriate.

Corridor serves an average of 1,800 jobs per station, and has over 6,500 jobs around the Emory Clairmont station. The Enhanced Transit Corridor serves an average of almost 1,300 jobs per station, but is heavily influenced by large concentrations at the Cumberland Mall and Roswell Road stations. In the one-mile transit zone, the Emory Clairmont and the CDC/Emory stations on the Clifton Corridor serve about 25,000 jobs each. Along I-75, the trio of Cumberland Boulevard, Cumberland Mall, and Windy Ridge serve a high concentration of jobs with around 30,000 jobs per station.

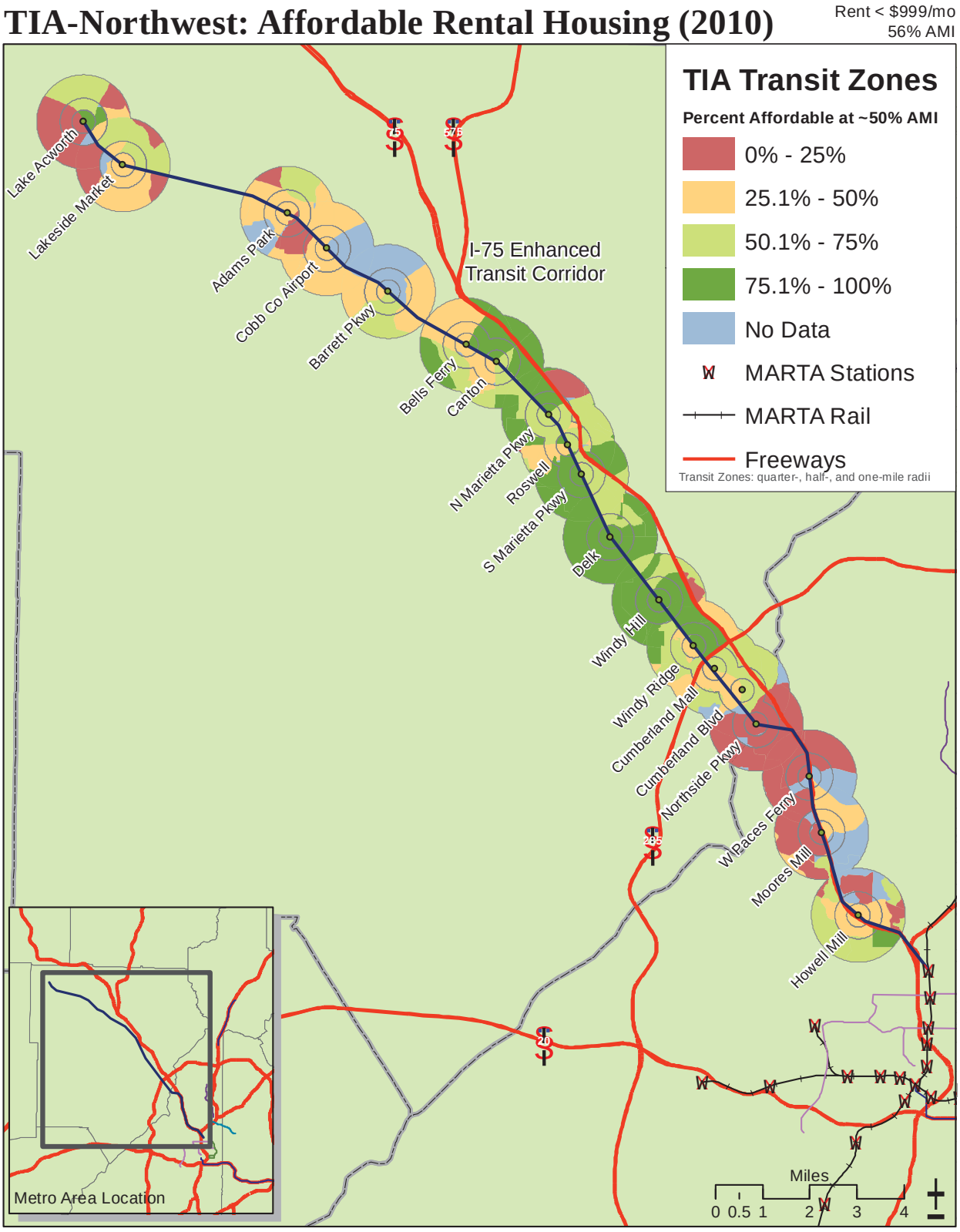
The BRT line travels a comparatively dense employment corridor, ranging from 20 jobs per acre within a quarter-mile to 9 jobs per acre within a mile. Clifton Corridor and the southwest Beltline/Streetcar projects also have comparatively high densities within the quarter-mile transit zone, but all the projects fall below the 25 jobs per acre transit threshold. In the one-mile transit zone, densities range from a low of just 1.3 for the I-20 corridor to a high of 20.9 for the Beltline/ Streetcar northeast segment, which benefits from including most of Midtown's business district. The Clifton Corridor is touted as a jobs connector for having 71,500 jobs located within one mile of its five stations, but it only has an average density of 7 jobs per acre in the one-mile transit zone.

TIA-Central: Affordable Rental Housing (2010)

Rent <$999/mo
56% AMI



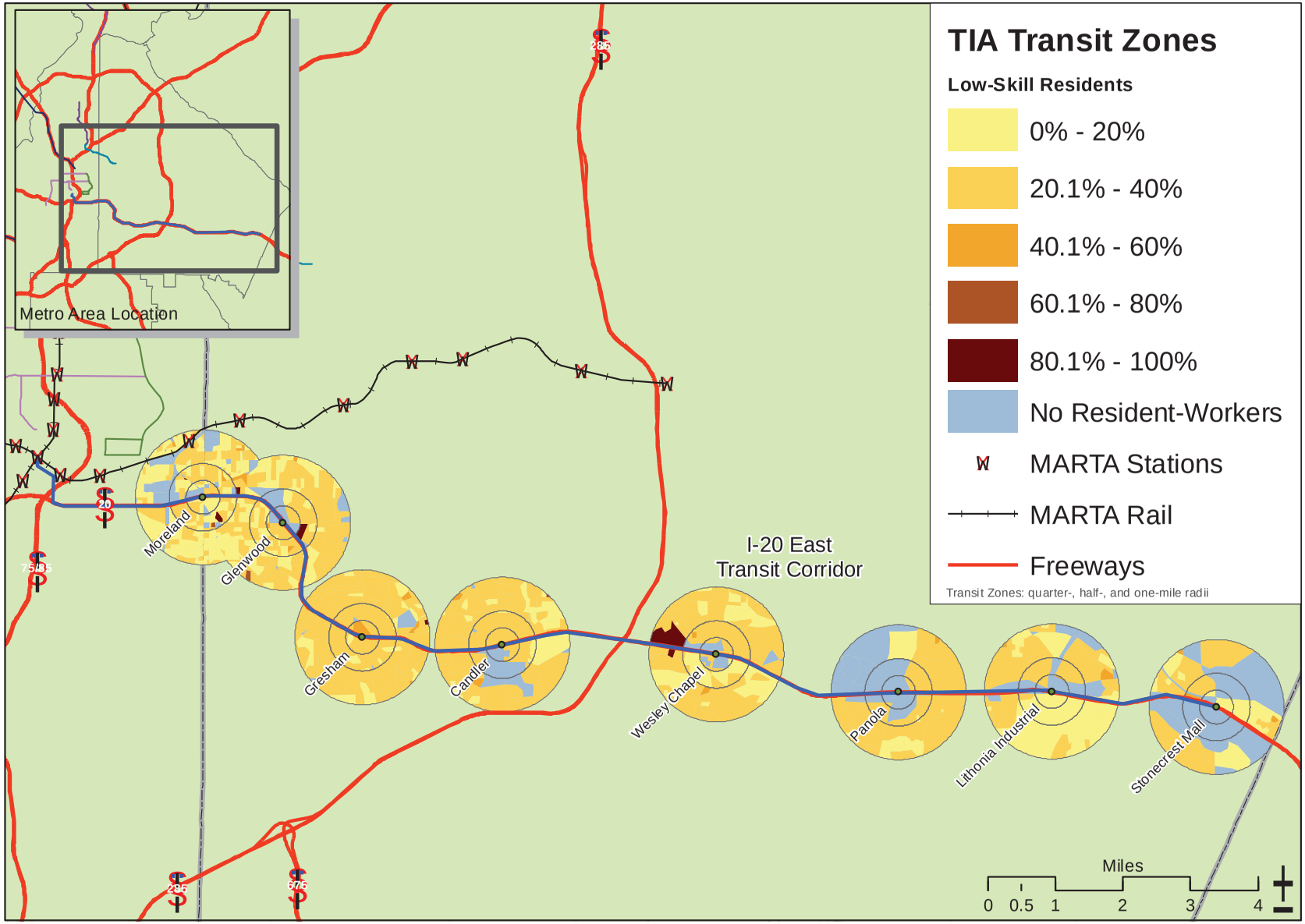
Map 9: Affordable Housing Near the Central TIA Projects

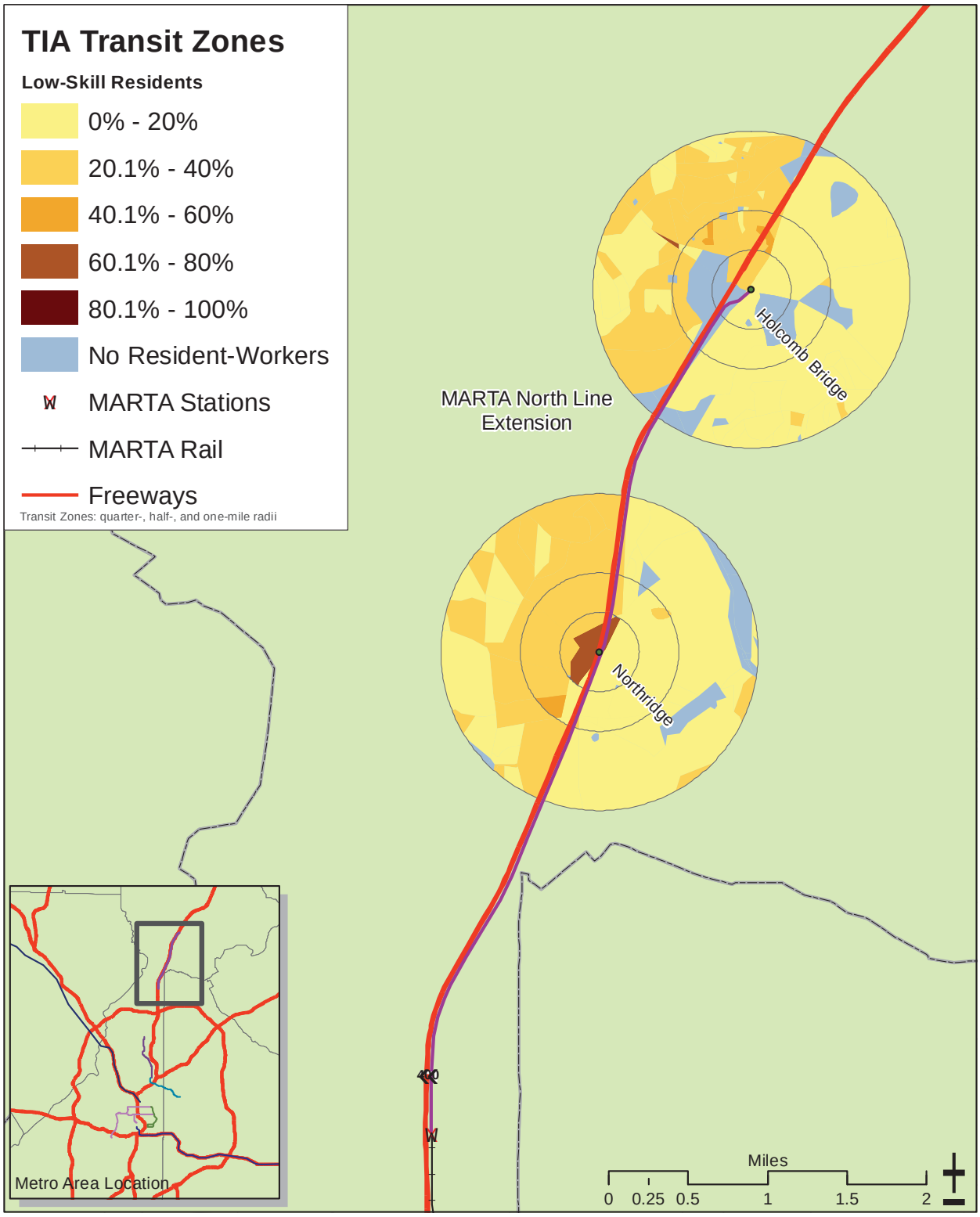


Map 10: Affordable Housing Near the I-75 Corridor

TIA-East: Low-Skill Workers Near Transit (2009)

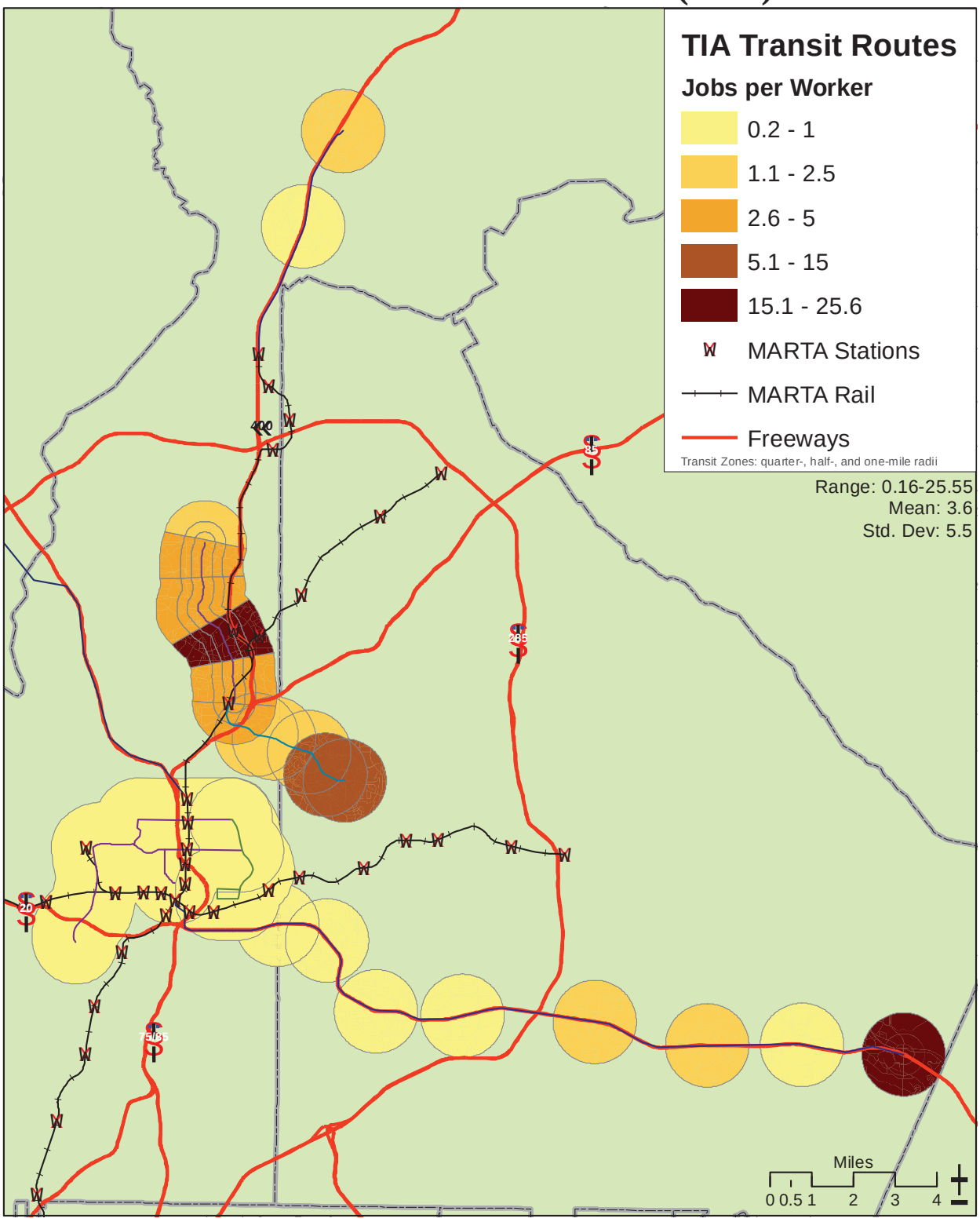
Map 11: Low-Skill Workers Living Near I-20





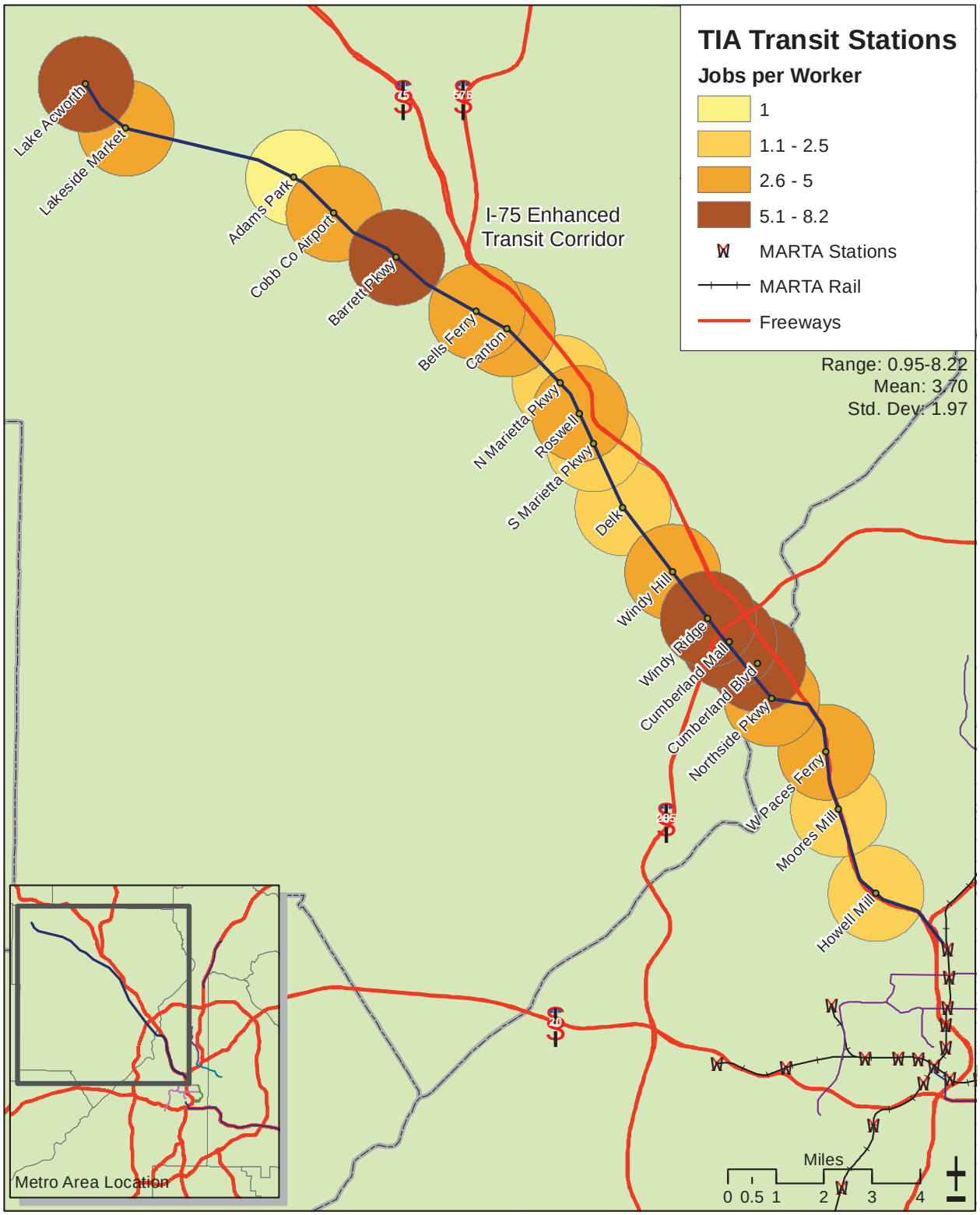
Map 12: Low-Skill Workers Living Near North Line Extension

TIA: Low-Skill Jobs to Low-Skill Workers (2009)



Map 13: Low-Skill Jobs to Workers Ratio Near TIA Projects

TIA-Northwest: Low-Skill Jobs to Low-Skill Workers Ratio (2009)



Map 14: Low-Skill Jobs to Workers Ratio Near I-75 Corridor

Housing Affordability

The TIA transit routes have several areas where affordable housing is in short supply as shown in Maps 9 and 10. The BRT route has a low share of affordable housing but a better percentage of workforce units along its length. Affordable units comprise less than half of the rental stock within the one-mile transit zone of three stations along the Clifton Corridor and almost half of the Enhanced Transit Corridor stations. The Emory University area at the end of the Clifton Corridor and two areas along the Enhanced Transit Corridor, one inside I-285 and another north of Bells Ferry, have very few affordable units. The areas near Emory and inside I-285 contain higher income neighborhoods and as a result have low shares of both affordable and workforce housing.

The stations between Windy Ridge and Canton on the Enhanced Transit Corridor have high percentages of affordable housing and especially workforce housing. The North line extension likewise has good affordability levels. Generally speaking, most of the housing along the TIA transit routes are affordable to workforce households.

Low-Skill Workers and Jobs

The I-20 corridor project represented in Map 11 has the highest percentage of low-skill workers living in the quarter-mile transit zone at 23 percent, and only Stonecrest Mall and Moreland Avenue have shares lower than 20 percent. The BRT line and the Clifton Corridor have the lowest percentages in the quarter-mile transit zone at 14 percent and 16 percent respectively. The shares are relatively unchanged within the one-mile transit zone: I-20 has the highest proportion and the BRT line, Clifton Corridor, and northeast Beltline/Streetcar have the lowest. The North Line extension shown in Map 12 serves the highest average number of low-skill workers within one mile of a station with about 1,200, compared to around 500 per station along the I-75 Enhanced Transit Corridor.

The I-20 corridor has the largest percentage of low-skill jobs within both the quarter-mile and one-mile transit zones. The Stonecrest Mall and Candler Road stations stand out with over 50 percent of the jobs within a quarter-mile being low-skill, reflective of a large number of retail and service positions at the nearby malls. At the opposite end of the spectrum, both Marietta Parkway stations and the Northside Parkway station on the I-75 Enhanced Transit Corridor serve a very low percentage of low-skill jobs, less than 10 percent each in the one-mile transit zone.

Figure 4 represents job density and the jobs to worker ratio graphed relative to one another. It demonstrates the relatively low employment densities for most of the TIA stations but a much wider range of job to worker ratios. The two Beltline/Streetcar projects are outliers in terms of employment density, while Stonecrest Mall and Segment 3 of the BRT route (both located off the chart) are outliers in terms of jobs to worker ratios. The I-20 stations are clustered closest to the bottom left indicating low densities and low jobs to workers ratios.

The North Line extension is the most balanced in total jobs to workers and low-skill jobs to workers. Its overall jobs-housing balance is similar but the low-skill job to affordable housing ratio is a Type 3 imbalance. Interestingly, most of the TIA projects have a jobs-housing balance near one, especially the ratio of low-skill jobs to low-burden housing. The Clifton Corridor has the highest jobs-housing ratio, while the BRT project and the I-75 project have the highest jobs-worker ratios.

Figure 5 compares the overall jobs-housing balance and the low-skill jobs to affordable housing balance around each rail station. 6 stations have an overall ratio within the target range and 3 stations have a low-skill jobs to affordable housing ratio in the target range, including both Beltline/Streetcar projects. There are 27 Type 3 imbalances for the overall ratio and 23 for the low-skill to affordable ratio. The Clifton Corridor demonstrates the large concentration of jobs at the last two stations and the more residential areas around the first three stations.

Figure 4: Job Density to Jobs-Workers Scatter Plot

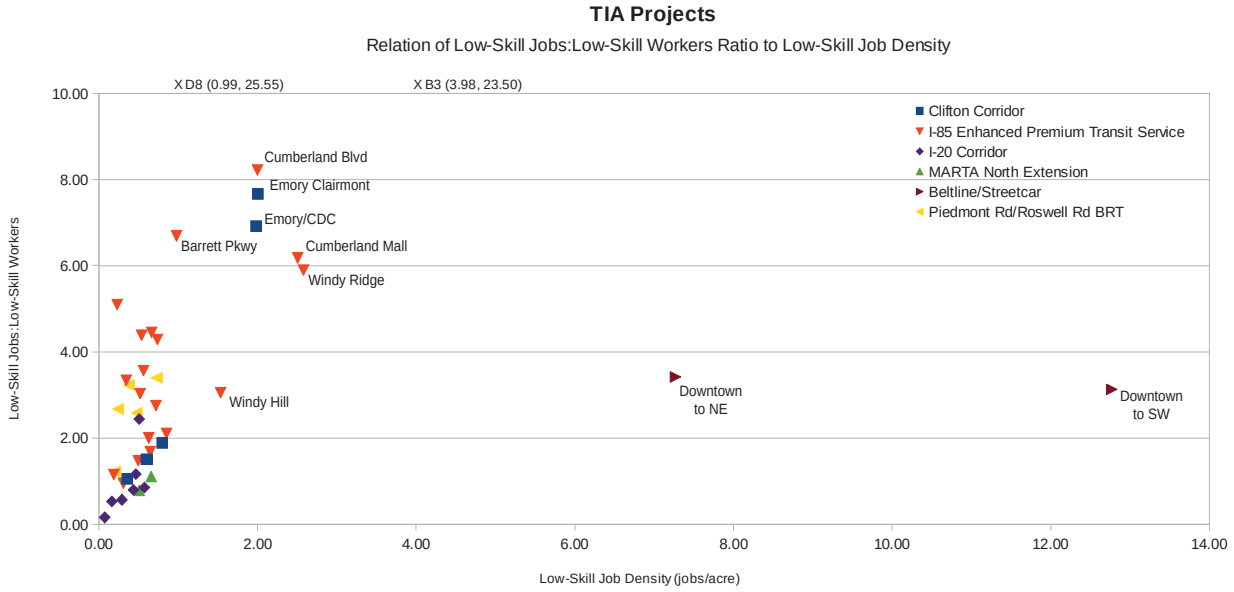
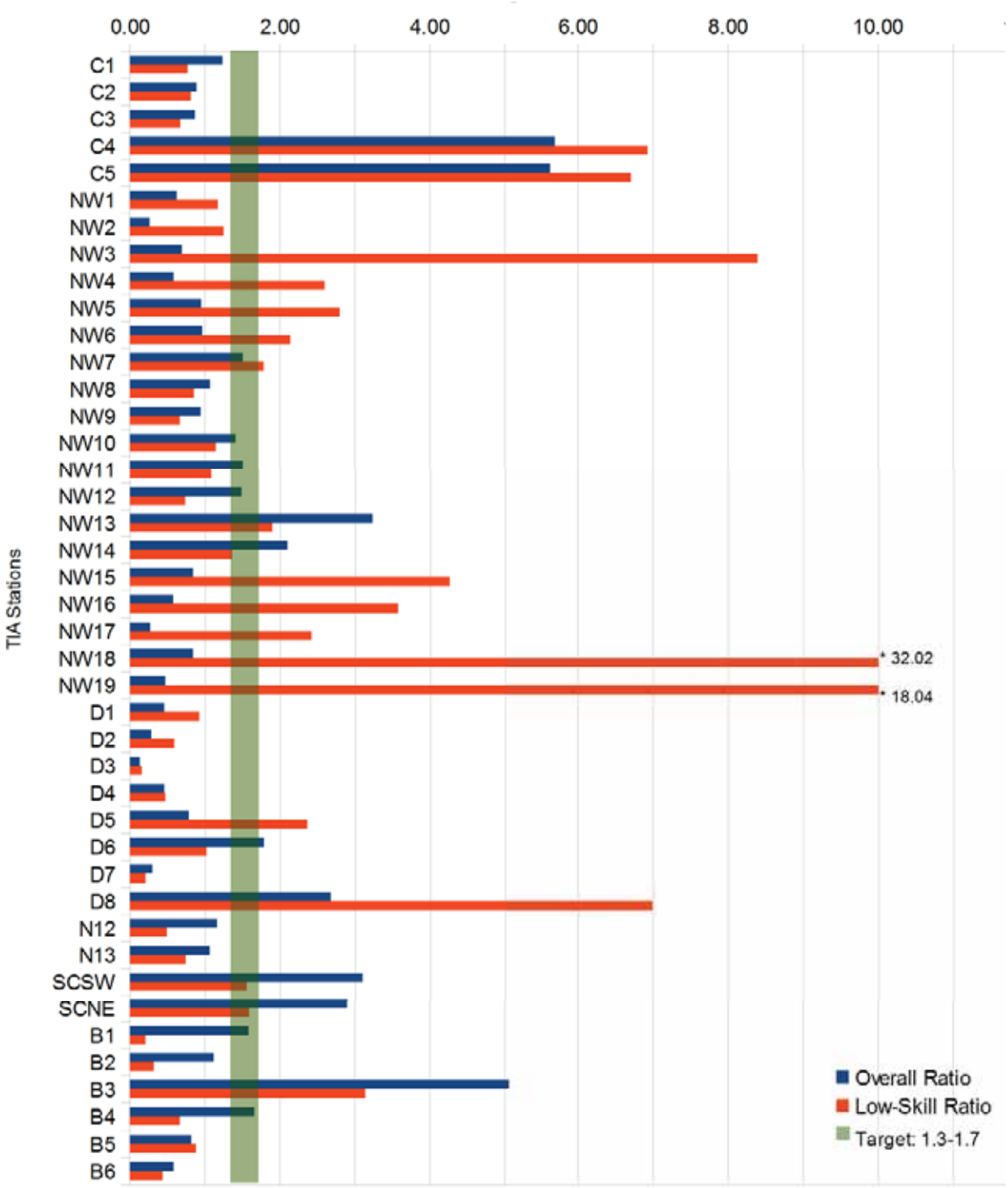
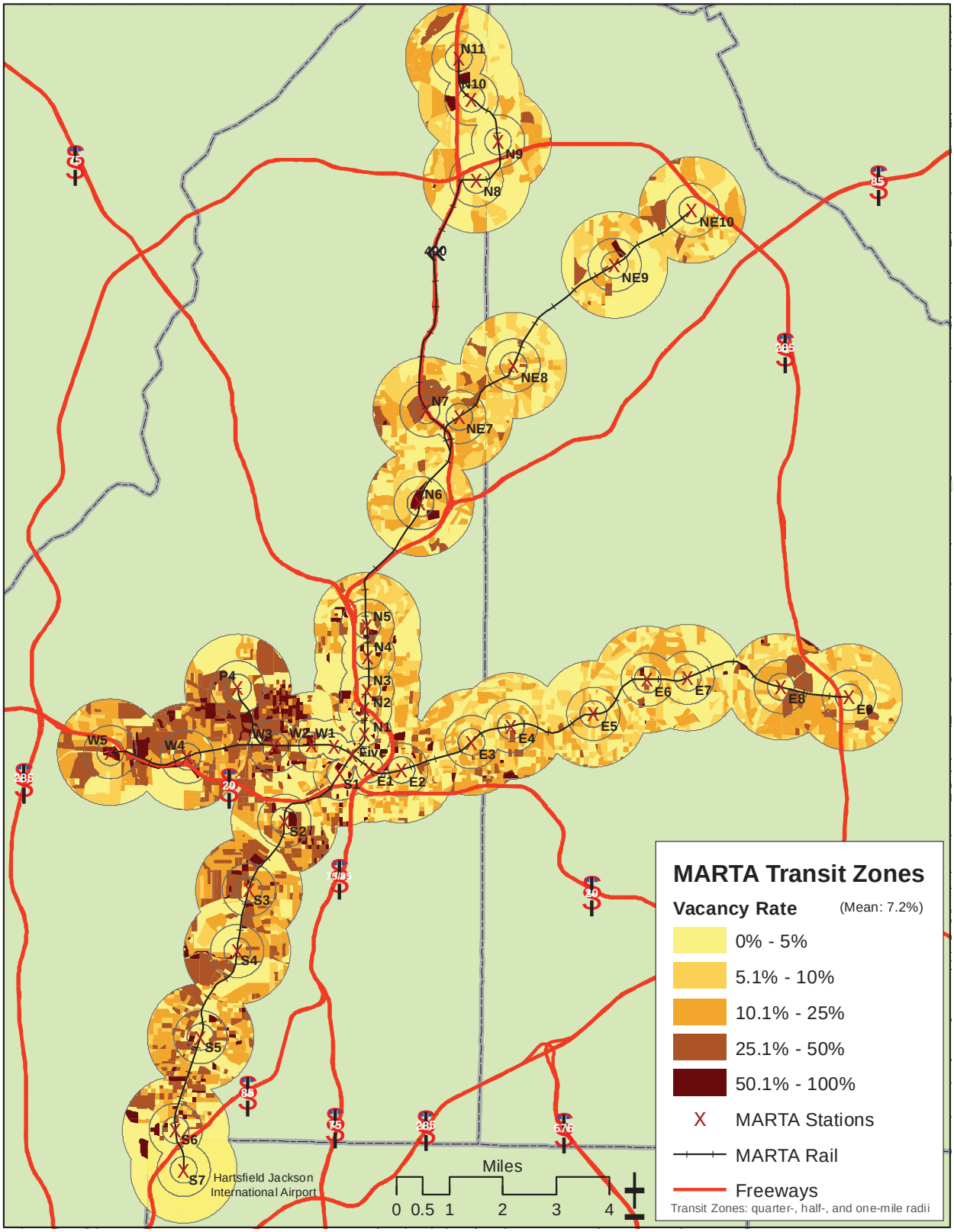


Figure 5: TIA Jobs-Housing Ratios

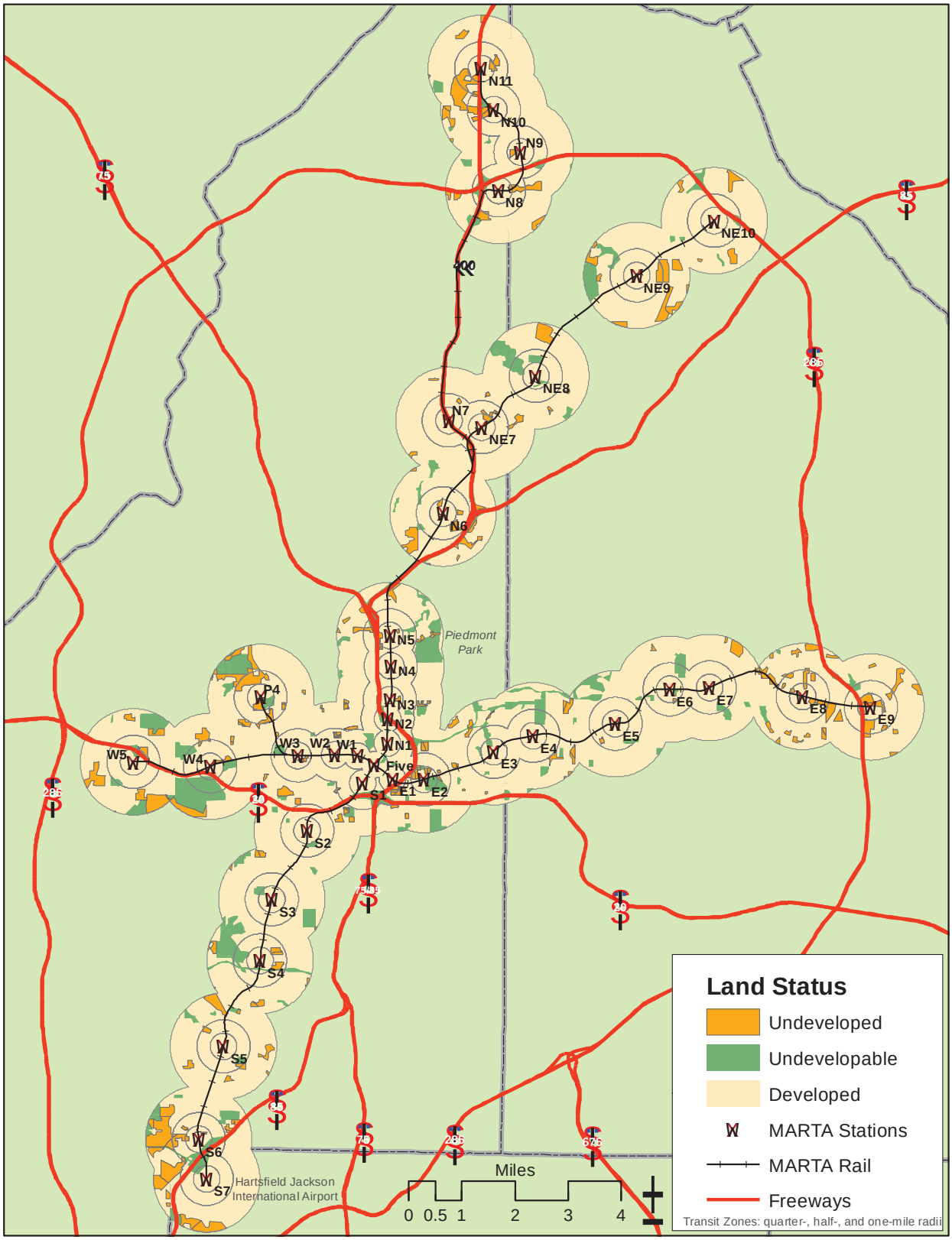


MARTA Rail: Housing Vacancy (2010)



Map 15: Housing Vacancy Near MARTA

MARTA Rail: Undeveloped Land (2010)



Map 16: Undeveloped Land Near MARTA

MITOD Potential

The next step in the analysis is to identify potential locations for the creation or preservation of affordable rental housing and for new mixed-income transit oriented development. One indicator is housing vacancy rates which reveal areas that have an existing building stock that is being underutilized. These are opportunities to revitalize neighborhoods by bringing empty houses back onto the market as affordable rental properties. A second indicator is undeveloped land. Some of this land may be prime for the creation of new mixed-income communities or infill housing that serves to increase both the housing stock and density of an area. Both of these indicators are crude measurements however. Field surveys and other more in-depth exploration is required before determining the actual potential for MITOD, but these provide an initial idea of where to focus those efforts.

Potential Around MARTA Stations

Map 15 shows housing vacancy around existing MARTA stations. The average vacancy rate across housing within one mile of rail stations is 7.2 percent. The map illustrates high concentrations of vacant units along the west and south lines, with smaller pockets along certain stations on the other two lines. Lindbergh Center and Buckhead stations, for example, have 40 percent and 30 percent average respective vacancy rates within the quarter-mile transit zone, representing a total of almost 650 vacant units in ideal walking distance of a MARTA station. Many of these likely correspond to condominium units that have been selling slowly, if at all, since the recession began.

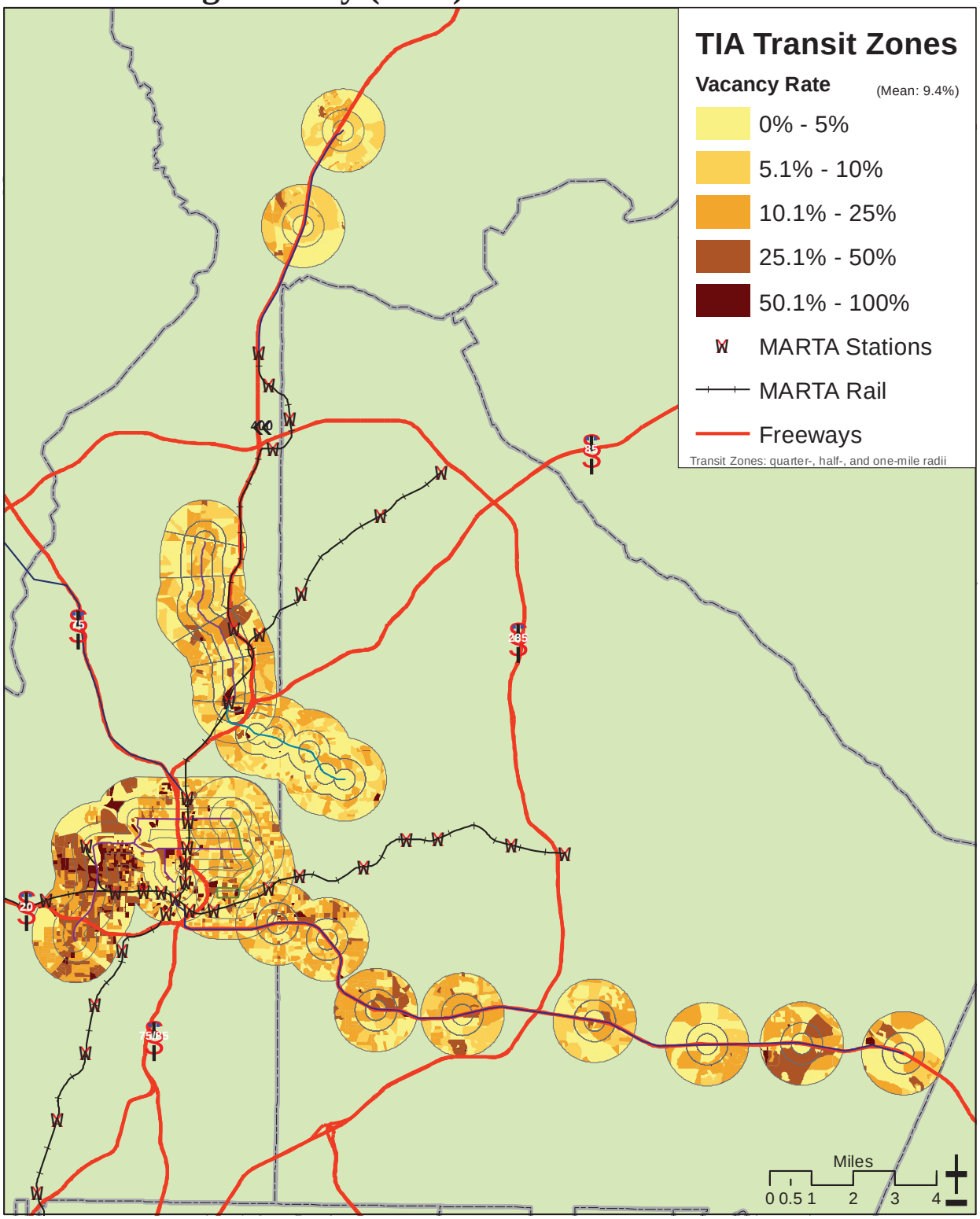
The west line has the highest average vacancy rate at 32 percent, and none of the stations have average rates below 26 percent. Bankhead has the highest rate at 42 percent, representing 2,700 vacant housing units clustered south and east of the station in the one-mile transit zone. Ashby has the highest number of vacant units with just under 3,200 in the north and west areas of the one-mile transit zone. The south line has the second highest housing vacancy rate at 23 percent with less variation between stations than along the west line. West End station has the highest number of vacant units at 1,700.

The east line has the lowest average vacancy rate at only 14 percent of housing units. East Lake, Decatur, and Avondale stations located in the middle of the line have the lowest rates in the MARTA system at under 9 percent, with higher vacancy rates at the end of the line and closer to Downtown. The north and northeast lines both have around 17 percent average vacancy, ranging from lows around 9 percent at Brookhaven and Doraville at the end of the northeast line to highs around 25 percent at Five Points and Peachtree Center downtown. These lines are also notable in that they have a generally decreasing rate of vacancy as distance from downtown increases; the other lines are much more random in their distribution.

The second indicator is the amount of undeveloped land near transit stations, taken from ARC's LandPro10 data file which was updated in 2010. This provides a rough measure of available land, some of which could be potential locations for MITOD or infill housing. An analysis of this data for MARTA reveals that the North line has the most undeveloped land, over

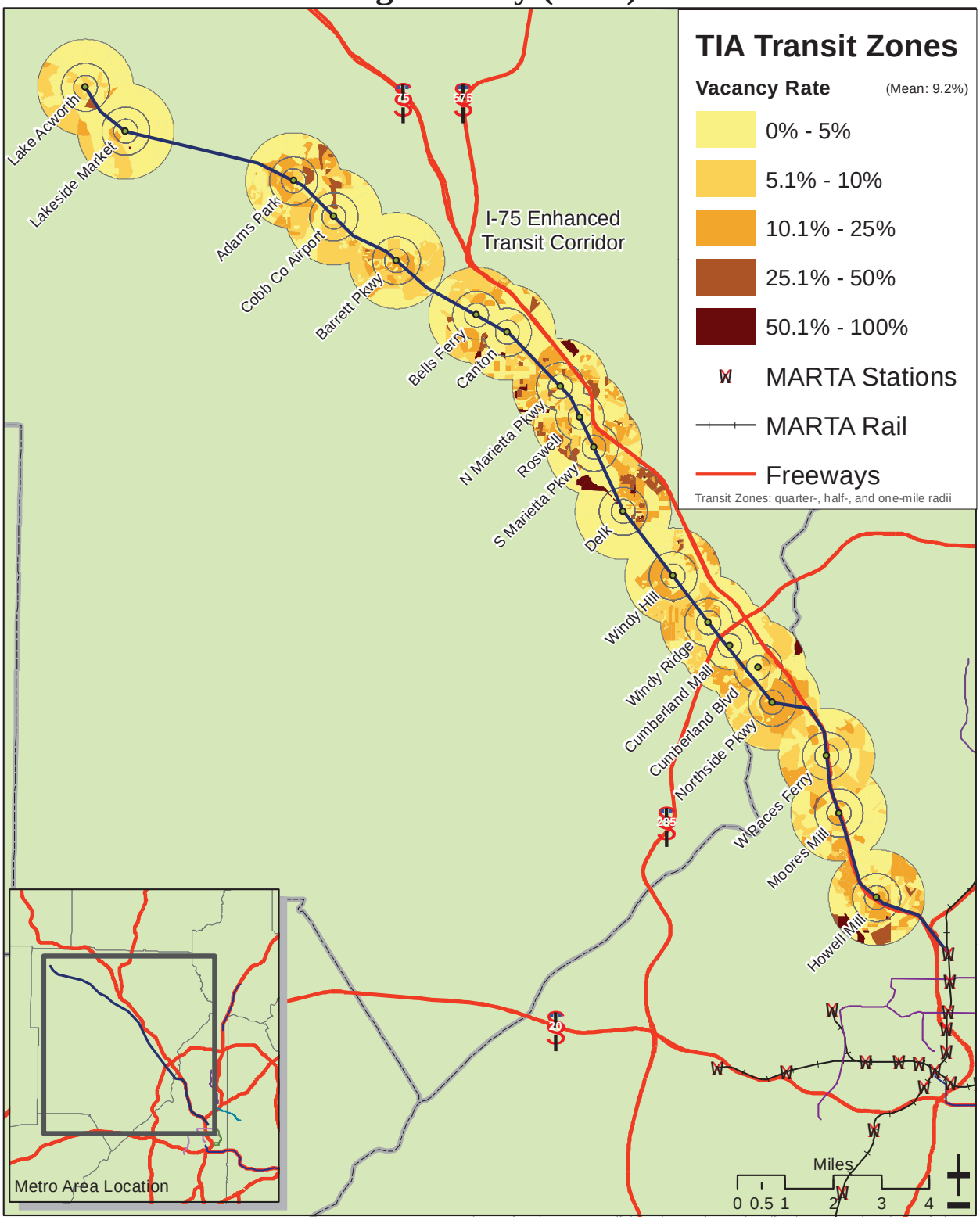
1,100 acres, most of it located around the Sandy Springs and North Springs stations as shown in Map 16. The Indian Creek station on the east line has 40 acres of undeveloped land within a quarter-mile and stands out as having the most undeveloped land within that transit zone in the MARTA system. College Park on the south line has about 300 undeveloped acres within one mile, making it the station with the most undeveloped land overall. As expected, most lines have the greatest amount of undeveloped land away from downtown near the end of the line.

TIA: Housing Vacancy (2010)



Map 17: Housing Vacancy Near TIA Projects

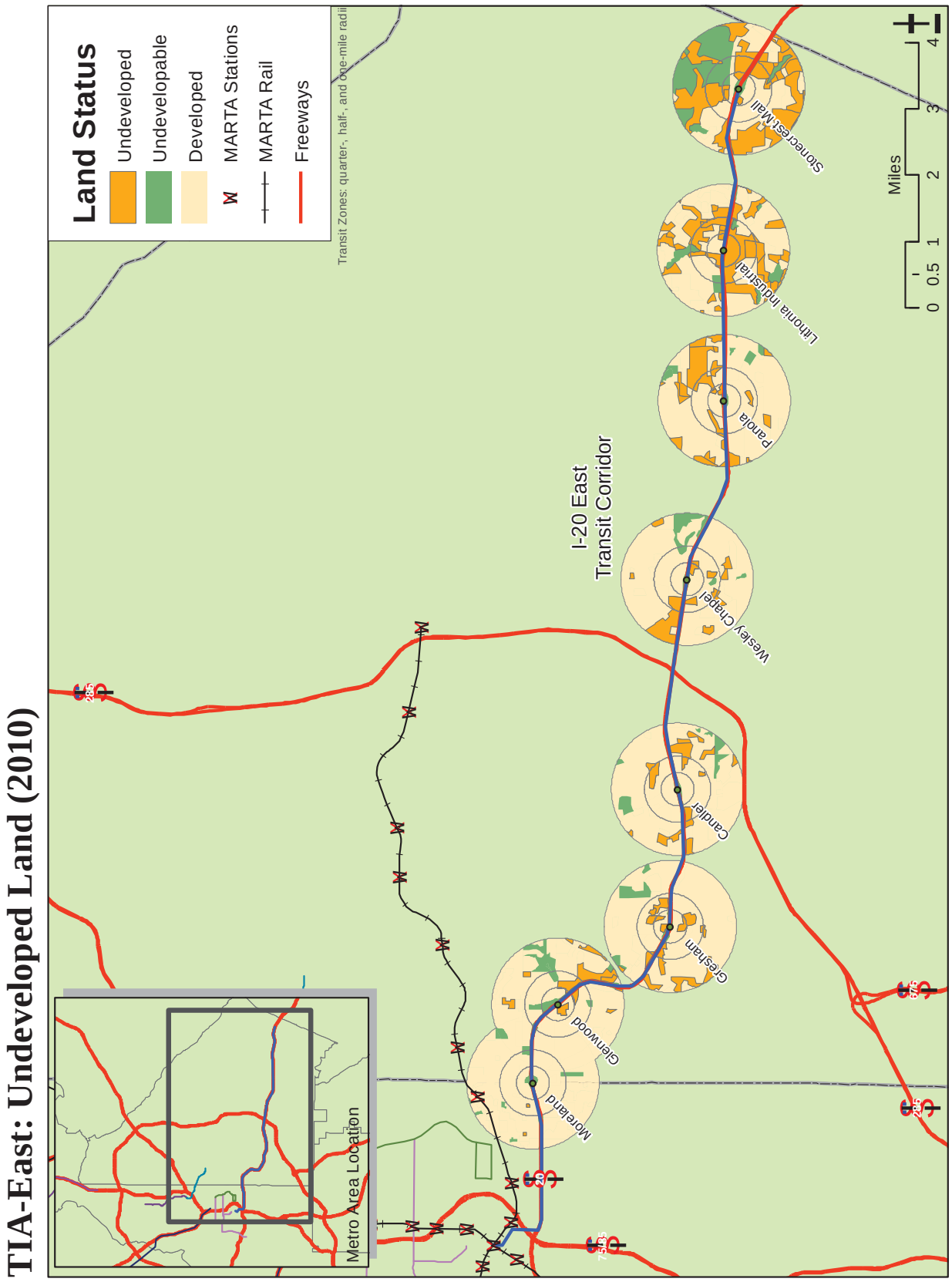
TIA-Northwest: Housing Vacancy (2010)



Map 18: Housing Vacancy Near the I-75 Corridor

TIA-Northwest: Undeveloped Land (2010)

Map 19: Undeveloped Land Near the I-75 Corridor



Map 20: Undeveloped Land Near the I-20 Corridor

Potential Around TIA Transit Projects

Maps 17 and 18 illustrate housing vacancy within one mile of all the TIA transit projects. The average rate is 12 percent, ranging from 10 percent along the Clifton Corridor, I-75 Enhanced Transit Corridor, and the North Line extension up to 23 percent along the southwest Beltline/Streetcar route. The southwest route has around 14,000 vacant units within one mile, but the linear buffer includes a much larger area than any one station zone. On the I-20 corridor, the Lithonia Industrial and Gresham stations have high housing vacancy rates compared to the rest of the corridor. Segment 3 of the BRT line and the Marietta Parkway area on the I-75 corridor are two other notable clusters of high vacancy rates in the TIA projects.

Delk Road on the I-75 corridor has the highest average housing vacancy rate in the one-mile transit zone at 26 percent, and has an even higher rate closer to the station. The station area has a very higher proportion of renters and a below average housing density. There are over 2,400 vacant units within one mile of the station, although Cumberland Boulevard has the highest number of vacant units with around 3,100.

At the opposite end of the spectrum, the Lakeside Market station also along I-75 has only a 4 percent average vacancy rate despite having over 10,000 units within one mile of the station. It also has one of the lowest renter percentages at only 12 percent. Along the Clifton Corridor, only the Cheshire Bridge station has an average housing vacancy above 10 percent within one mile. As with the MARTA lines, housing vacancy generally rises as distance from downtown increases, with the I-75 corridor as the largest deviation from this trend.

The two longest TIA routes are shown in Maps 19 and 20 and unsurprisingly have the most undeveloped land along them. The I-75 corridor has almost 3,000 undeveloped acres around 19 stations, and the I-20 corridor has almost 2,500 acres around 8 stations. The I-75 corridor stations, however, have the second lowest average number of undeveloped acres around each one, about 150 acres each, while the I-20 stations have double that. The Stonecrest Mall station has the most land of any TIA station classified as undeveloped, with over 800 acres within the one-mile transit zone, and Lithonia Industrial has another 600 acres. The Clifton Corridor also has a high average number of undeveloped acres around its five stations, about 270.

Transit-Oriented Development Policies

The last phase of the analysis briefly reviews current TOD policies adopted by MARTA and policies and programs in four other cities: San Francisco, Denver, Minneapolis, and Charlotte. This review will describe the current state of MARTA TOD policy and provide guidance to help form recommendations on how to shape future development in the Atlanta region.

MARTA Transit-Oriented Development Guidelines

MARTA adopted its TOD Guidelines in 2010 to establish a framework for new development near its transit stations. It combines research on ten peer cities to learn best practices with an analysis of the rail system in place now and design guidance on elements of new infill development. It concludes with a model TOD Zoning Overlay.

The TOD district, or zone of influence around a station, is defined as the area within a quarter- to half-mile of a rail or bus rapid transit station. This is also referred to as the station area and corresponds with the average distance a person will walk to take transit regularly. The core area extends a quarter-mile or less from the station and is the most critical area to accommodate pedestrians, bicyclists, drivers, and transit users in the same shared space.

In the analysis section, MARTA describes seven station typologies to facilitate a better understanding of the function and development potential of each: urban core, town center, commuter town center, neighborhood, collector, special regional destination, and arterial corridor. For some rail stations the classification reflects its current environment; for others it sets a target for future growth to achieve. The final category, arterial corridor, is applicable to BRT and streetcar lines that run in the street right-of-way.

These categories are accompanied by a list of criteria including density. Residential density is described in units per acre and employment density as a floor area ratio (FAR), a measure that is commonly used in municipal zoning regulations but that requires knowing the building and lot area to determine. MARTA sets a target of greater than 75 dwelling units per acre around urban core stations, 25-75 units per acre around town center and commuter center stations, and 15-50 units per acre for neighborhood stations and arterial corridors. Collector and special regional destination stations do not have thresholds because of their unique character.

The Guidelines state three reasons justifying the inclusion of affordable and workforce housing issues into the consideration of transit-oriented development. The first is that any TOD is made possible by substantial public investment and thus should benefit all people, not just the affluent who can afford the higher land costs in many transit-rich neighborhoods. Second, many Atlanta residents are transit-dependent because of low household income or advanced age, and these residents deserve access to move about freely without a car. Finally, MARTA emphasizes the documented need for workforce housing in the area by citing a DeKalb County study of the topic completed in 2010.

To meet this need, MARTA establishes a goal of making at least 20 percent of units in residential or mixed-use TOD projects affordable to low income and elderly residents (MARTA, 2010). A diverse group of stakeholders is acknowledged as needing to play a guiding role in accomplishing this, utilizing a range of policy and regulatory tools including density bonuses. Described in detail in the model overlay code in the documentappendix, MARTA recommends a 1 percent increase in allowable FAR for each 1 percentage point of affordable housing units provided , or a 1.5 percent bonus if those units are reserved for workforce housing (MARTA, 2010).

A 2011 study by Reconnnecting America identified 42 TOD funding programs in place, featuring many on the coasts but only two in the Southeast. The nature of the economy and especially the housing markets has made this an ideal time to purchase land in present and future transit corridors in order to eventually create affordable housing units when the market returns. Because many existing loan products do not match this medium to long-term timeframe or offer patient capital, several housing authorities and transit agencies have stepped into this void.

Denver Transit Oriented Development Fund and Denver Livability Partnership

Denver provides a particularly useful comparison because the FasTracks program there is very similar to the proposed TIA program in Atlanta. FasTracks is an ambitious 12-year transit expansion program for the eight-county Denver region funded by a 0.4 percent sales tax in addition to a variety of other sources. Voters approved the tax in 2004 to help fund 122 miles of commuter and light rail projects, 18 miles of BRT lines, and additional parking at transit stations (Regional Transportation District of Denver [RTD], 2011).

The Denver TOD Fund was established in 2009 with a grant from the MacArthur Foundation with the goal of creating or preserving over 1,000 affordable housing units near transit. Other partners include the City of Denver, quasi-governmental organizations, banks, nonprofits, and foundations (Urban Land Conservancy, 2012b). This program functions as a revolving fund and can be used to acquire and hold key properties for up to five years. To be eligible, properties must be within a half-mile of a future rail corridor or a quarter-mile of a high frequency bus line, and the units produced must be affordable for households making less than 60 percent AMI. The Urban Land Conservancy, which administers the fund, also seeks to scale up operations to include other municipalities near Denver that will benefit from FasTracks investment.

The Denver Livability Partnership (DLP) is a broader operation that includes an affordable housing emphasis. The Housing Development Assistance Fund provides grants of up to $750,000 to partner organizations for pre-development and holding costs for multifamily affordable housing sites near transit corridors. It is capitalized by a HUD Community Challenge Grant and US Department of Transportation TIGER II funds. DLP is also focused on capacity building and knowledge sharing to assist local partners and share best practices with other areas

that have affordable housing opportunities along transit corridors (Urban Land Conservancy, 2012a).

Bay Area Transit Oriented Affordable Housing Fund (TOAH)

This is a $50 million fund capitalized by 12 large investors in early 2011 to facilitate the purchase and medium-term hold of land for future transit-oriented development in San Francisco. The investors included the Metropolitan Transportation Commission (MTC), major banks, foundations, and six community development financial institutions. To qualify for a loan, potential projects must be inside the boundaries of a Priority Development Area and within a half-mile of quality transit. The TOAH Fund offers five loan products, ranging from bridge and construction loans to leveraged loans, for project pre-development, acquisition, and construction. Since its inception it has funded two projects for $10.1 million, representing 217 units (Metropolitan Transportation Commission, 2012).

Minneapolis Land Acquisition for Affordable New Development (LAAND)

Capital is provided for this revolving loan fund by the Metropolitan Council and the Family Housing Fund for the acquisition of land intended for affordable housing development. Land must be purchased within two years of an award, and development must commence between one and five years after. Projects built on this land must reserve more than 20 percent of units for households earning less than 60 percent AMI, an affordability requirement effective for 15 years for rental properties and 7 years for ownership projects. Additional criteria include meeting Green Communities standards and being located within a half-mile of rail or quarter-mile of bus rapid transit. LAAND funds also link to the employment aspect of affordable housing by awarding points for projects in a Census tract within five miles of at least 2,000 low and moderate wage jobs (Metropolitan Council, 2012).

Charlotte Housing Trust Fund

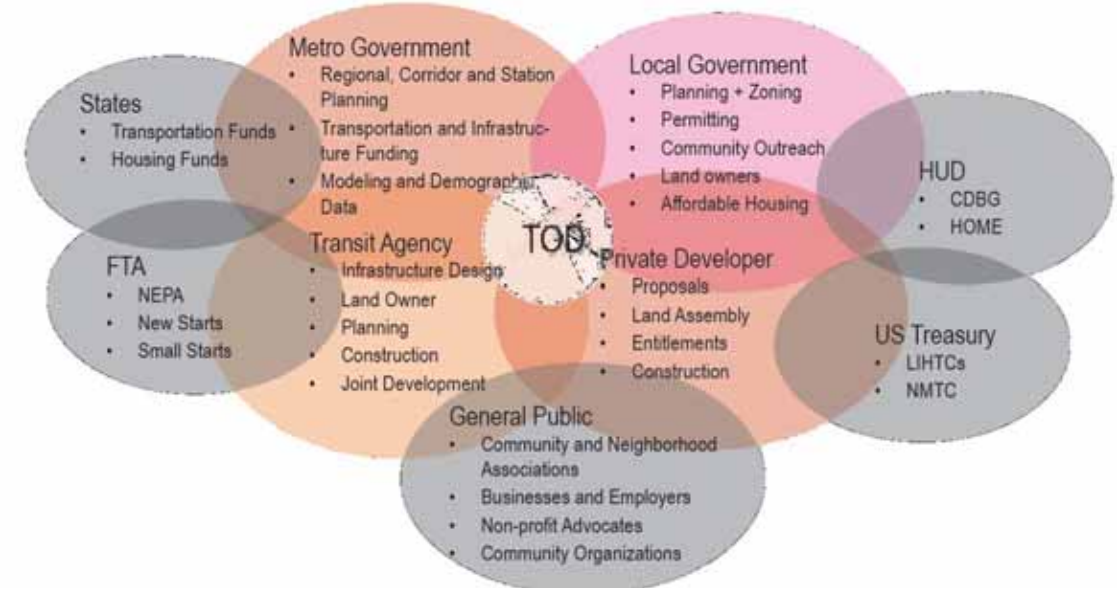
This fund was established in 2001 with capital provided by the City of Charlotte, which has designated a total of $86 million for it. Since then, it has helped finance over 4,300 new or renovated affordable units, including over 2,400 for households earning less than 30 percent AMI (City of Charlotte, 2012). Construction and land cost financing are provided through a bond issuance every two years.

Policy Recommendations for Atlanta

Several guiding principles emerge from the preceding literature and program review. First, it is critical to be proactive in acquiring key sites to create or maintain affordable housing near transit. This is an opportune time to secure valuable land at discounted prices and bank it for future development since the economy is still recovering from the recession and Atlanta especially continues to suffer depressed housing values. Also, uncertainty over whether the TIA bill will pass in July has likely kept land prices near the routes from appreciating too quickly. If it does pass, however, experience from other cities suggests that it is reasonable to expect an increase in land prices in those areas above the regional pace due to the newly created value from the transit investment. Waiting too long to act will require a larger capital investment to obtain control over fewer sites, thus limiting the impact that can be made.

Second, coordinating affordable housing planning with transit investments now could become even more important due to proposed changes in the New Starts and Small Starts federal funding programs, both of which are likely sources of additional funding for many of the TIA transit projects. A comment period was open from late January until the end of March 2012 about recommended revisions to the funding requirements for these programs (Reconnecting America, 2012). One recommendation is to include affordable housing in the consideration of the economic development impacts of transit investments. Another recommendation is to incorporate access to jobs by evaluating the proximity of transit to employment centers when determining ridership estimates. A third recommendation pairs the expansion of affordable housing opportunities near transit with new workforce and market-rate incentives to prevent concentrations of low income households in transit-rich neighborhoods. This attention to mixed-income housing will be important to ensure that the drive towards more equitable development does not recreate the mistakes of concentrating poverty in new areas, even if they are transit-accessible.

Figure 6: Typical TOD Stakeholders (Source: CTOD, 2009b)



Third, scalability is an important aspect in the design of a transit-oriented development fund. As shown schematically in Figure 6, a multitude of local municipalities and different levels of government will be involved given the regional nature of the TIA bill. Ensuring that their policies and incentives are coordinated and working toward the same ends will be critical to ensure regional success. A funding model that can be implemented at a local level initially and then scaled up to include more jurisdictions will allow weaknesses in the program to be discovered and corrected before being implemented across many areas. A network of partners that share knowledge and publicize lessons learned will be an asset to the region as well.

Based on the literature review, an overview of other transit-oriented development funds, and the research on existing housing and job characteristics around MARTA rail stations and proposed TIA transit corridors, a series of policy recommendations are set forth. First, leverage multiple funding sources to capitalize a revolving fund for land acquisition and holding costs in future transit areas. This needs to provide patient capital that will allow land to be purchased now when it is relatively cheap and then sold for development later when the market is ready. Sources could include local governments and transportation agencies, foundations, nonprofits, and private investors like banks. Second, formalize affordable housing requirements at a regional level to ensure equitable development at a large scale. Implementing strict requirements within individual jurisdictions is likely to drive development to nearby areas with fewer restrictions, circumventing the purpose. A coordinated policy can encourage MITOD in all new development. Third, include guidelines for workforce and market-rate units in these affordable housing policies to avoid creating concentrations of low-income households. This will foster diverse communities that will hopefully lead to informal networks to assist in employment searches. And finally, consider an employment policy that complements the housing effort. Incentivizing new jobs to locate near current and future transit facilities will attract more riders and increase the efficient utilization of the system. Some workers will be able to live within walking distance of their job near a transit station, while many others will be able to use transit for their daily commute. This benefits the region by attracting new companies seeking transit-rich locations and benefits individual companies by improving the quality of life for their employees.

Further Research

Introducing statistical analysis using correlations and regression would provide important information on the significance of the patterns observed in this research. If the TIA passes in July, studying the changes over time in housing and employment characteristics in these project areas will be essential. A more detailed analysis of specific MITOD opportunities identified here paired with field surveys of on-the-ground conditions and market analyses of local trends will confirm or refute their true potential while providing a more nuanced view of how to move forward.

There are also opportunities to expand the impact of this study. Adding layers of education and employment sector information, identifying the effects of race and income, exploring variations between rental and mortgaged housing units, and investigating travel mode and commute time differences are all potential future research directions that would provide valuable data to housing professionals.

Conclusion

Affordable housing and transportation investment are inextricably linked yet these policies are not always well-coordinated, leading to inefficiencies and missed opportunities. Low-income and workforce households who live near transit options that are connected to job and activity centers can significantly reduce their transportation costs and free more of their budget for other vital needs.

The July 2012 TIA vote in the Atlanta region provides an opportunity to make a substantial commitment to new and expanded transit facilities. It can be thought of as a housing and economic development tool as well as a significant transportation program. Future development around MARTA and these potential new transit routes presents an important opportunity to address the documented need for more affordable housing, especially housing that also links low-skill workers to more job opportunities. An analysis of the current rail system in Atlanta and the seven transit projects on the TIA list reveals that all of these areas need to increase their housing and employment density to make transit more effective, and MITOD can be one approach to help accomplish this goal.

Based on these observations, it is recommended that affordable housing policy focus on creating a multi-source loan fund to provide patient capital for the acquisition and holding of land near transit for future MITOD, coordinate affordable housing requirements at the regional level, and include policies on workforce and market-rate housing to produce vital mixed-income communities near transit. By promoting coordinated infill development around existing MARTA rail stations and the TIA transit routes if the referendum passes, Atlanta has the chance to secure a more equitable future for itself and a continued competitive advantage in the Southeast region and the nation.

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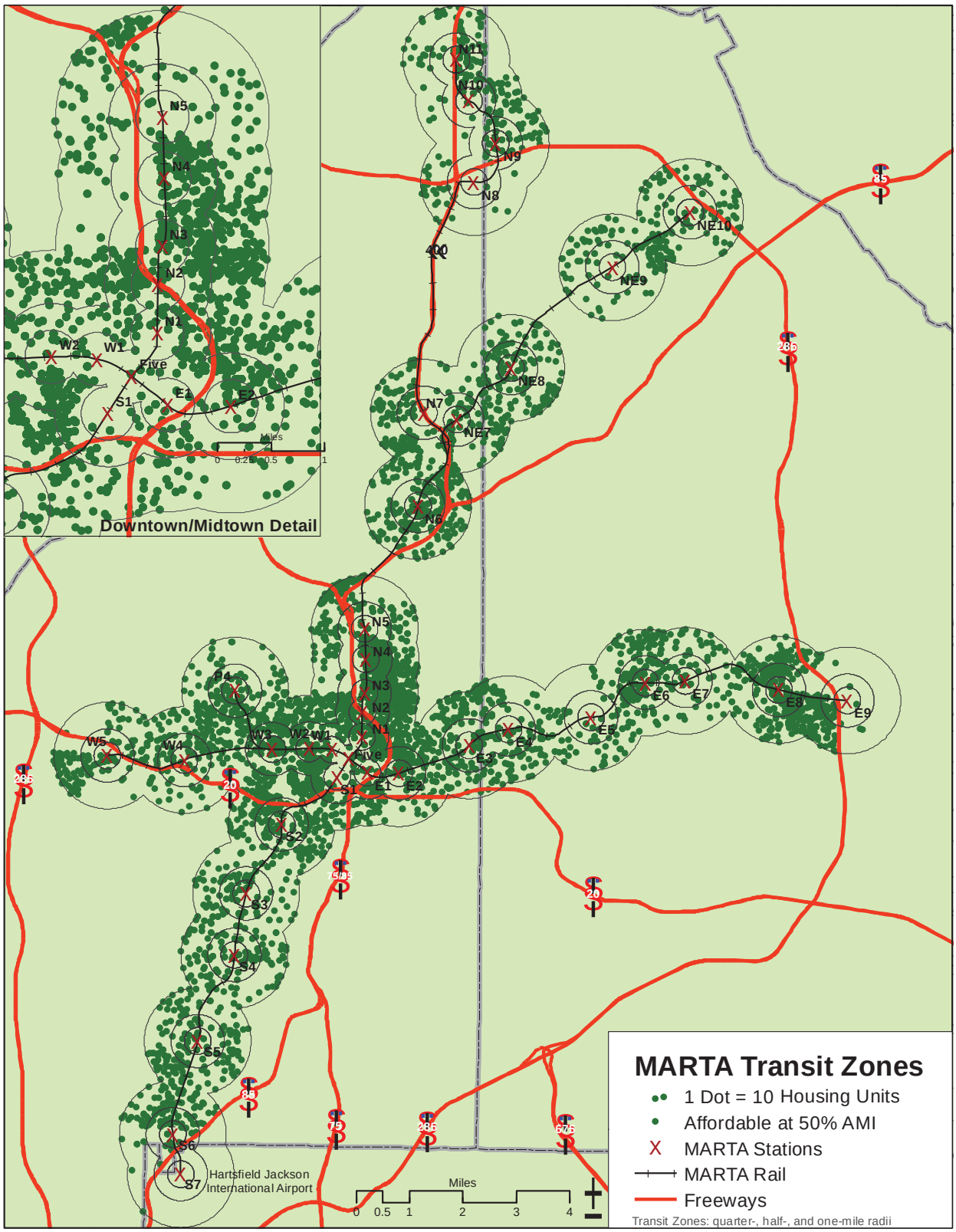
Appendix A

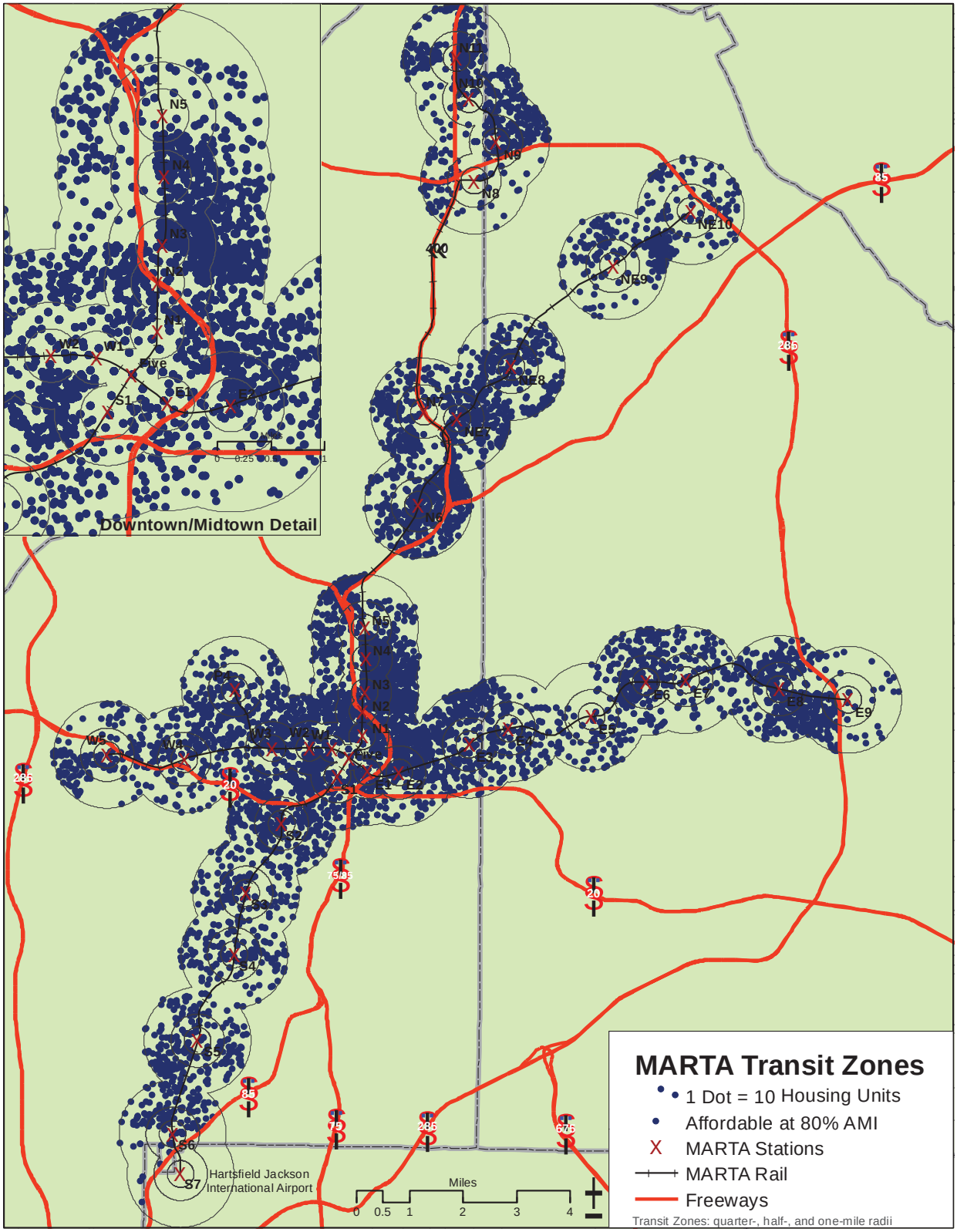
List of Supplemental Maps:

MARTA Rail: Rental Housing Affordability (2010)



Map A-1: Affordable Housing Near MARTA, Density

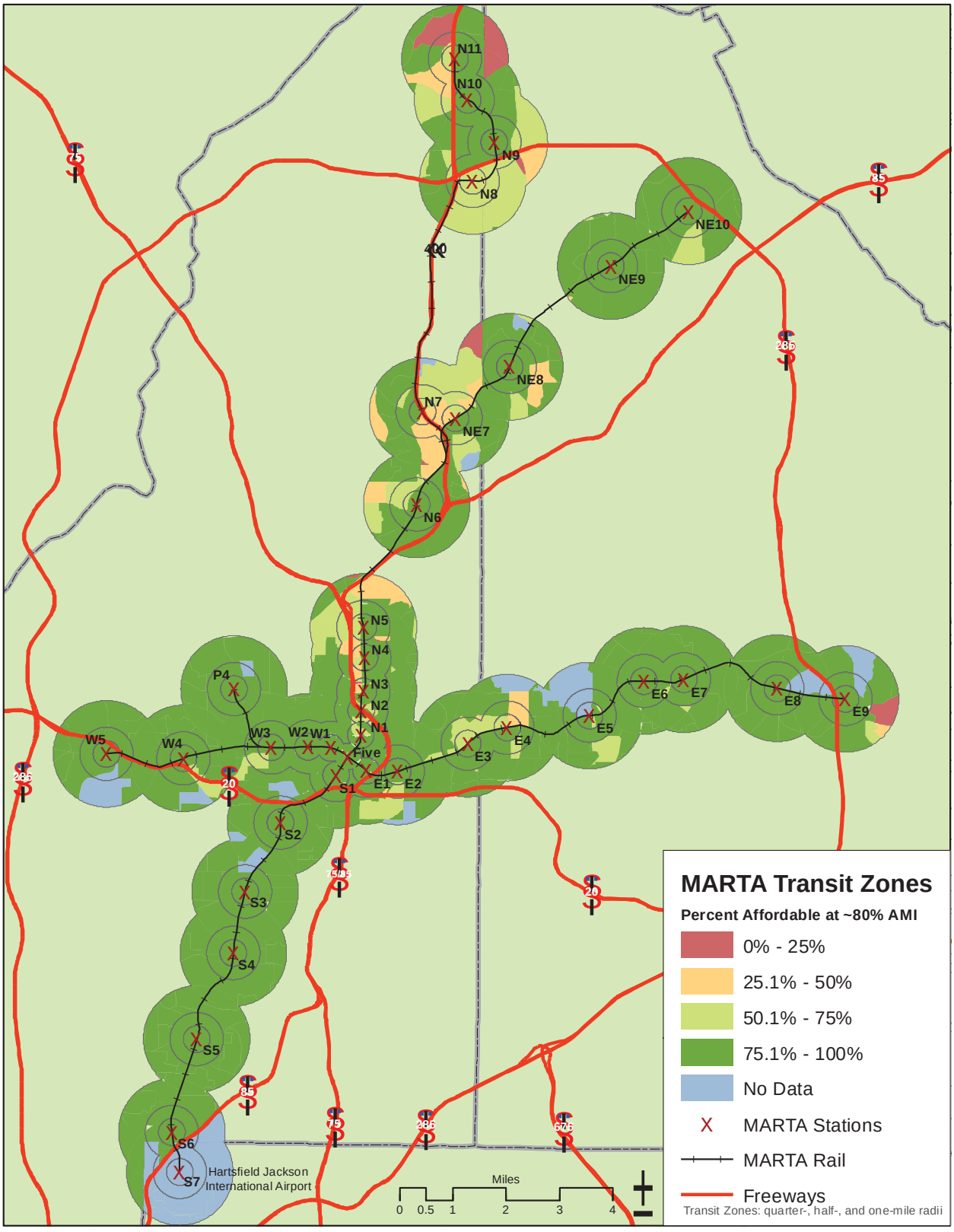
MARTA Rail: Rental Housing Affordability (2010)



Map A-2: Workforce Housing Near MARTA, Density

MARTA Rail: Workforce Rental Housing (2010)

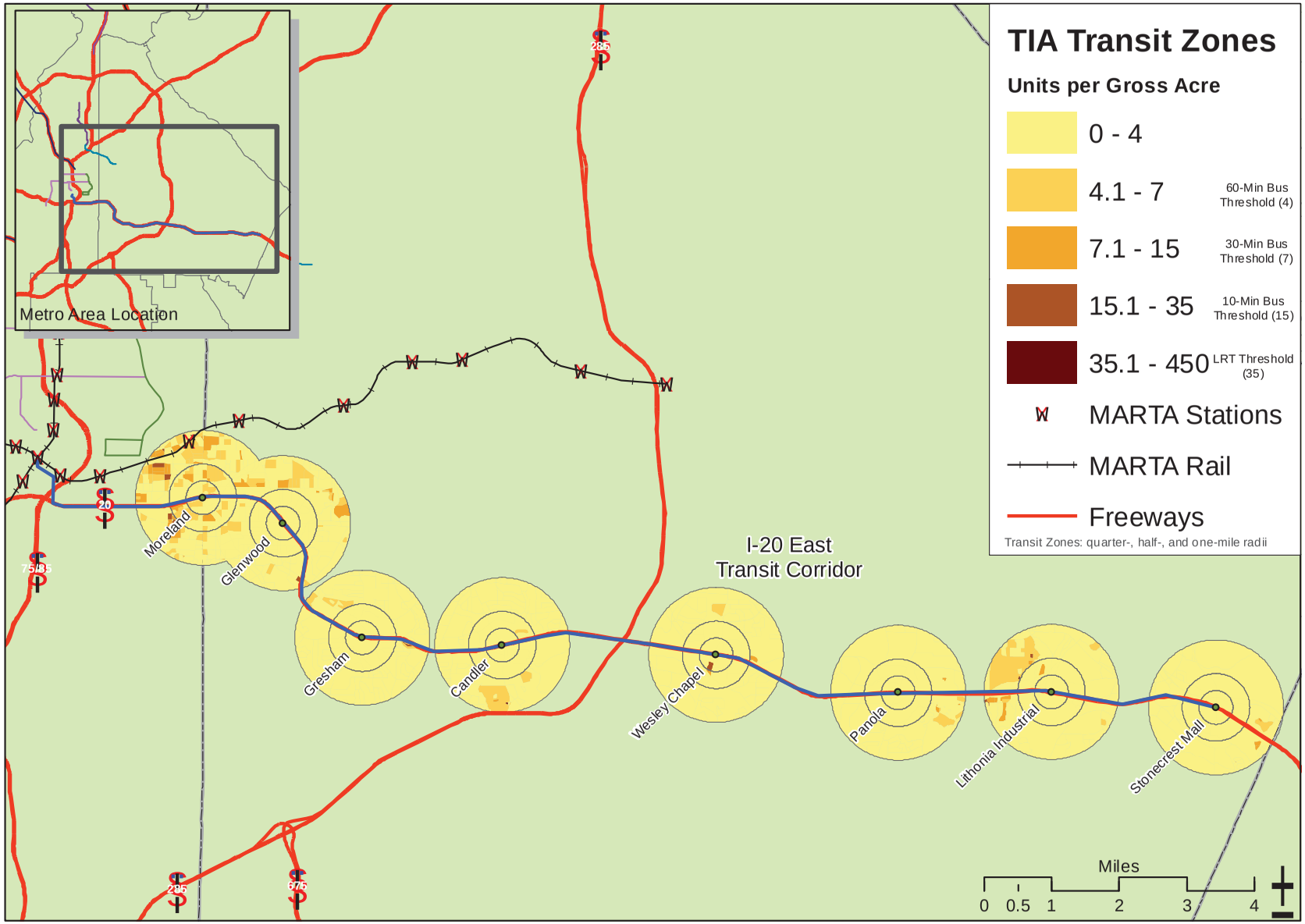
Rent <$1499/mo
84% AMI



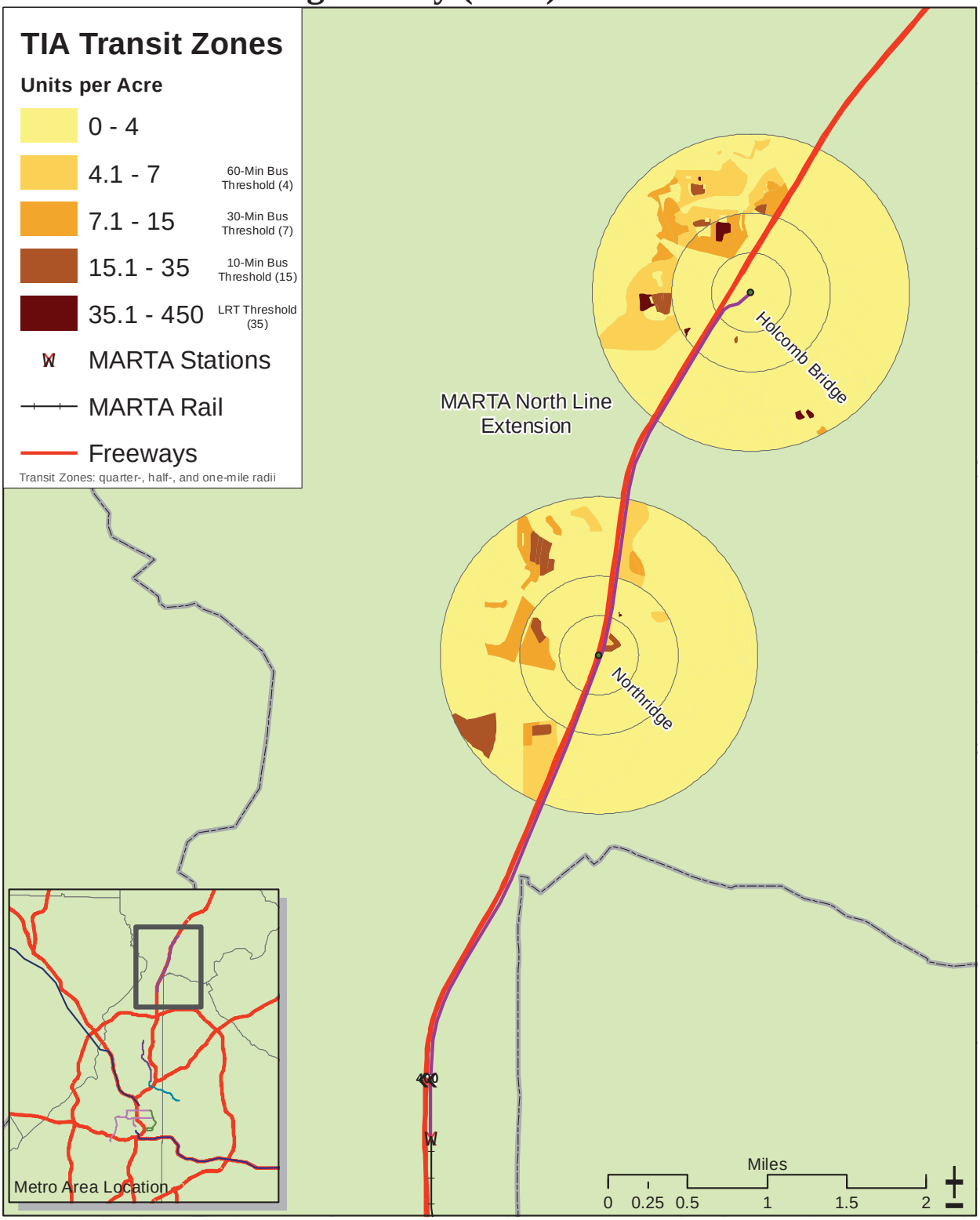
Map A-3: Workforce Housing Near MARTA, Percentage

Map A-4: I-20 Corridor Housing Density

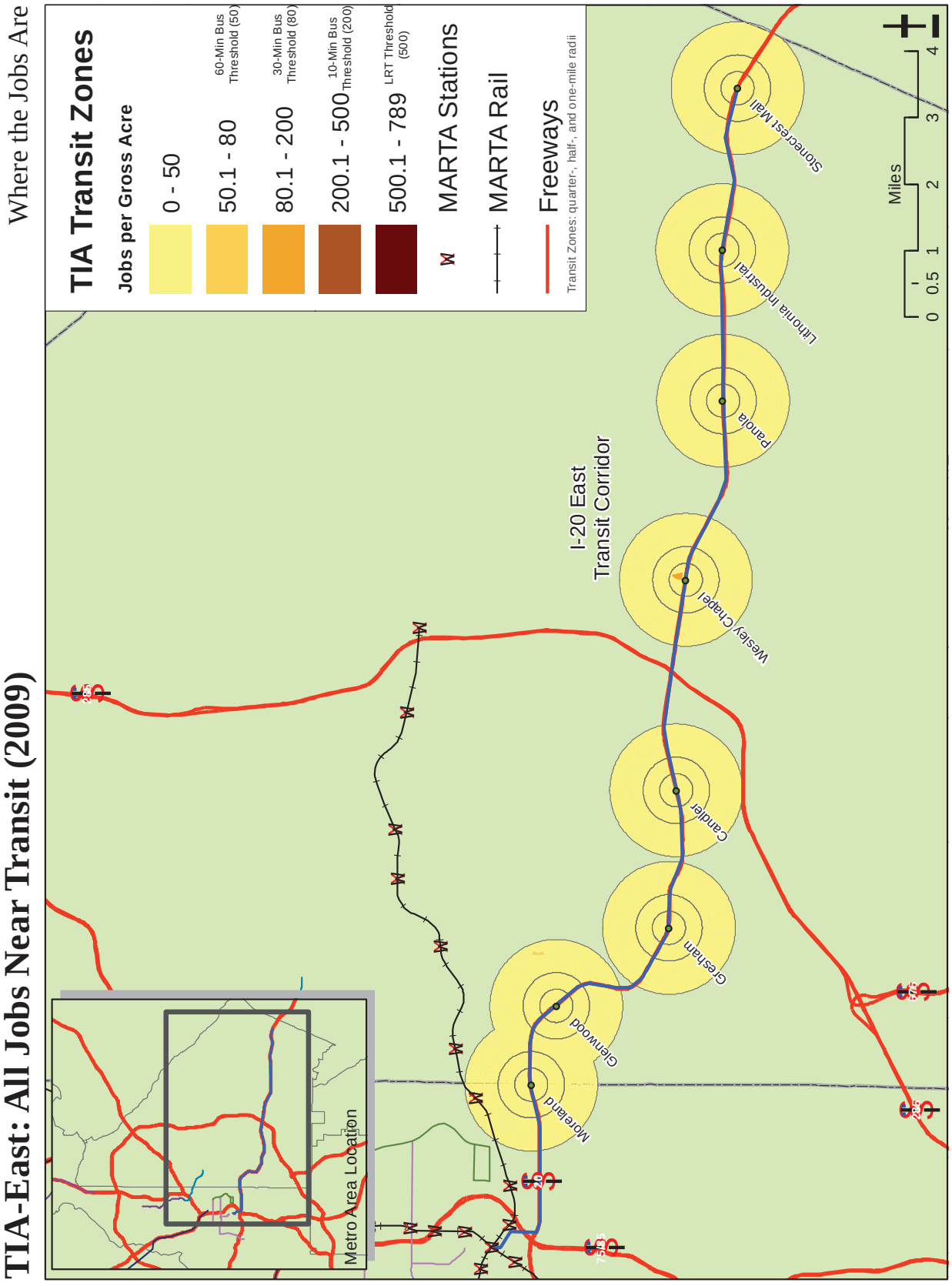
TIA-East: Housing Density (2010)



TIA-North: Housing Density (2010)

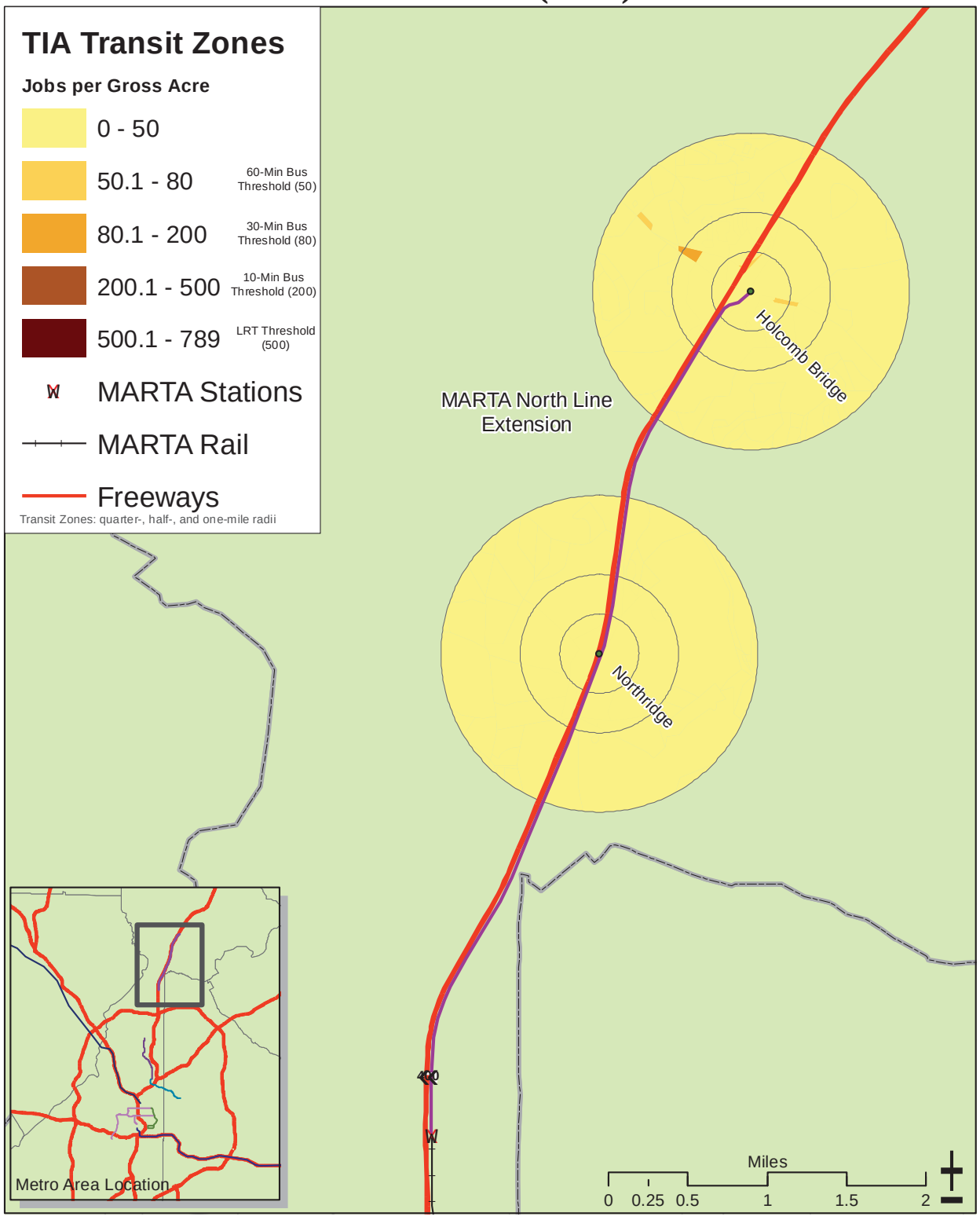


Map A-5: North Line Extension Housing Density



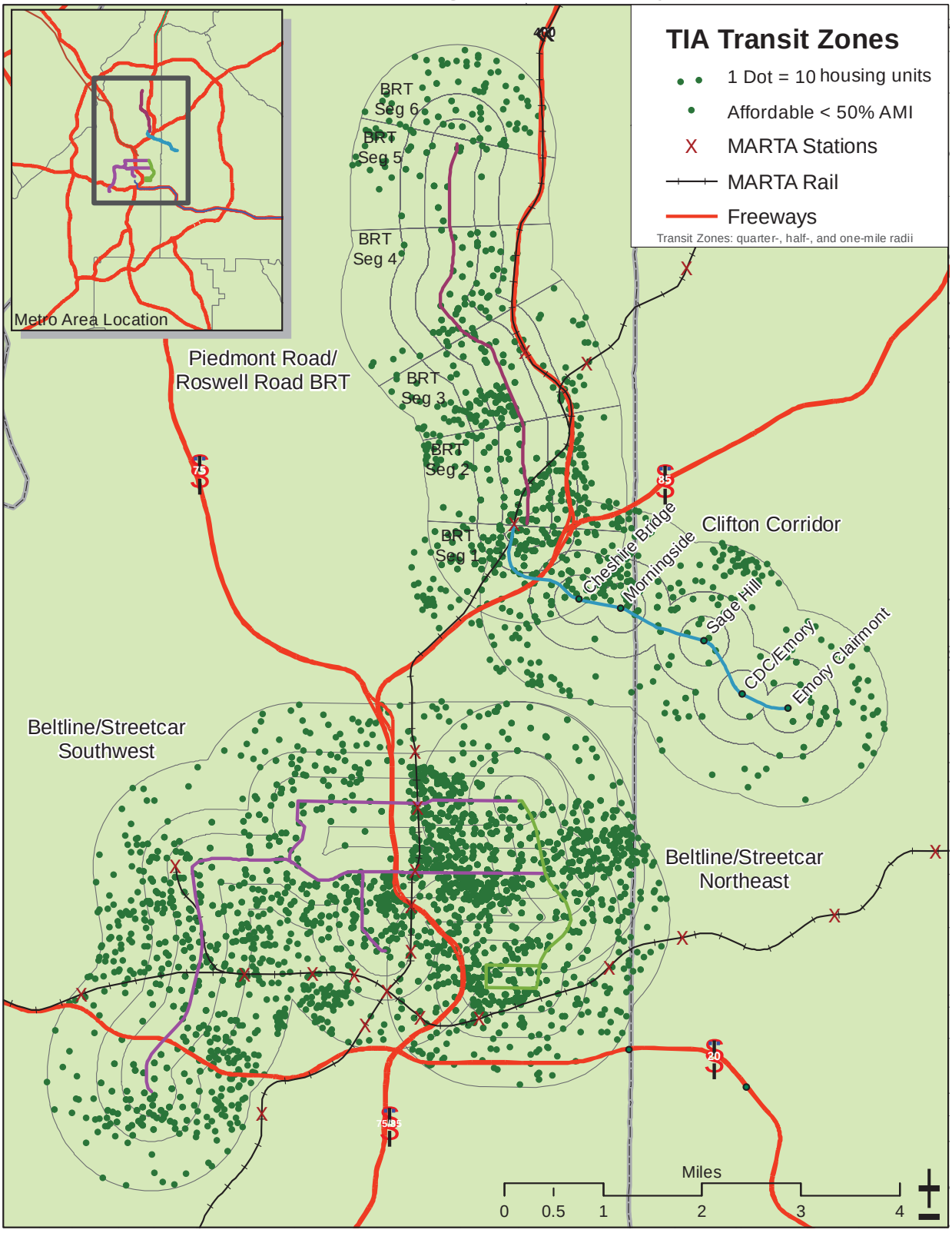
Map A-6: I-20 Corridor Employment Density

TIA-North: All Jobs Near Transit (2009)



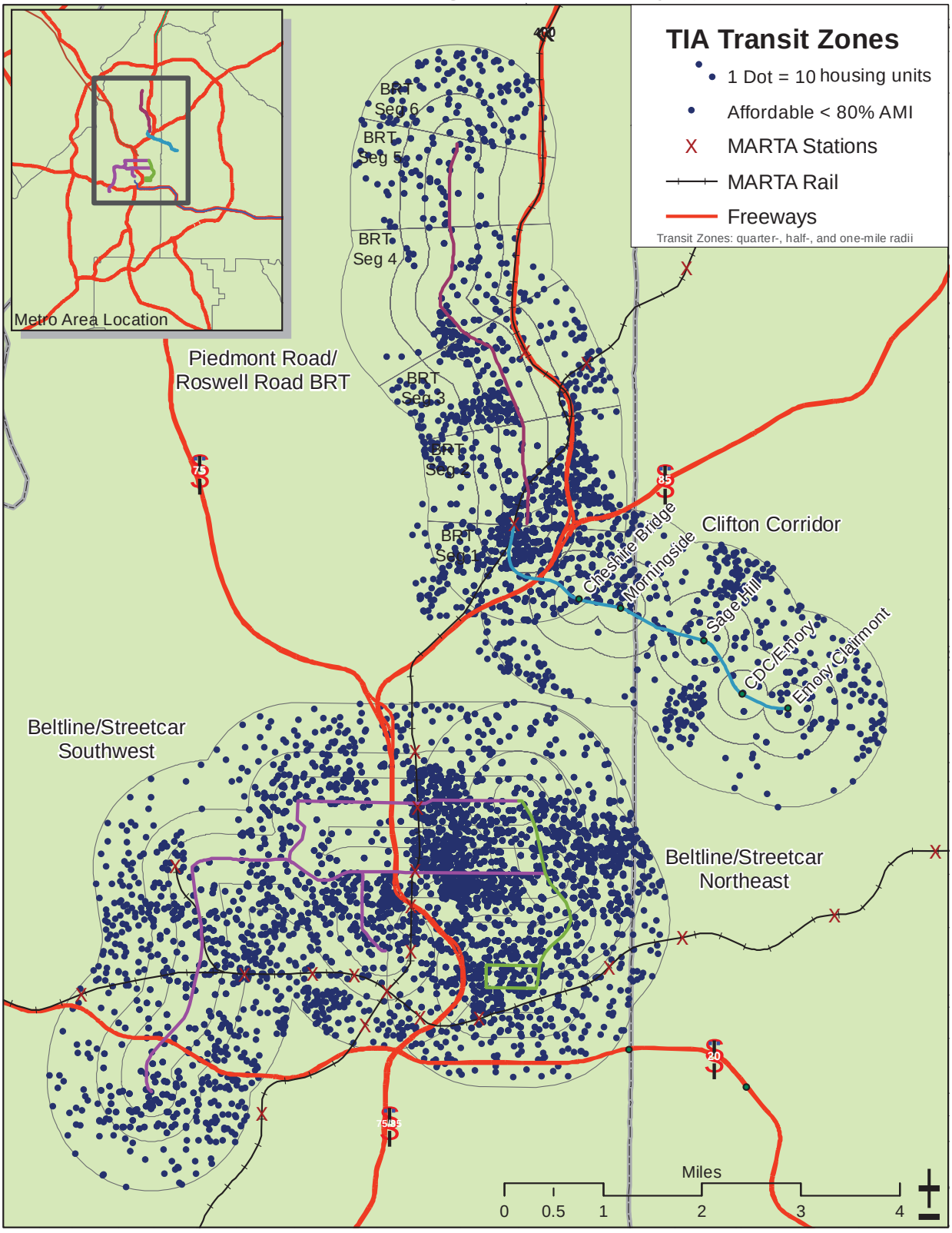
Map A-7: I-20 Corridor Employment Density

TIA-Central: Rental Housing Affordability (2010)

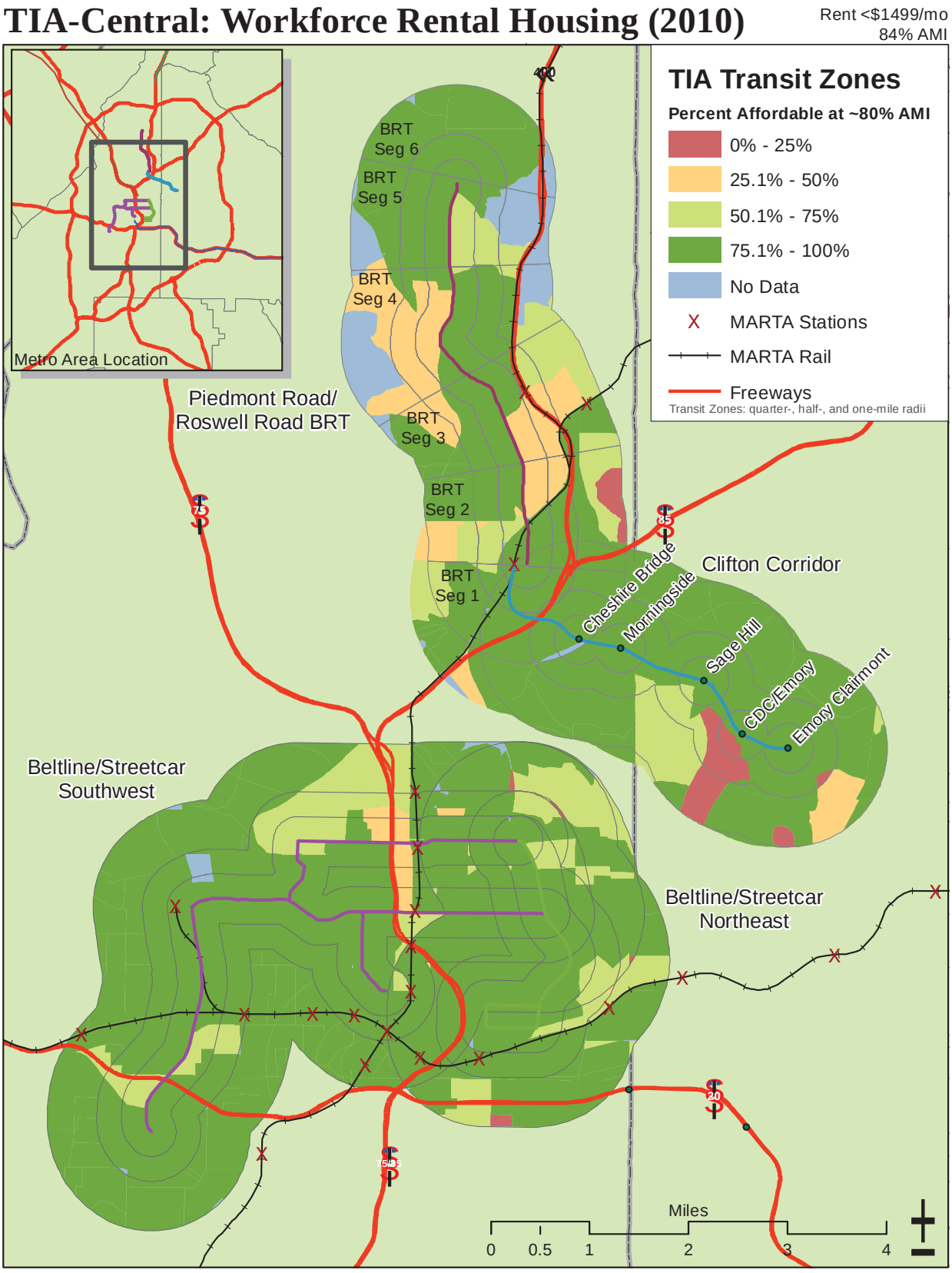


Map A-8: Affordable Housing near the Central TIA Projects, Density

TIA-Central: Rental Housing Affordability (2010)

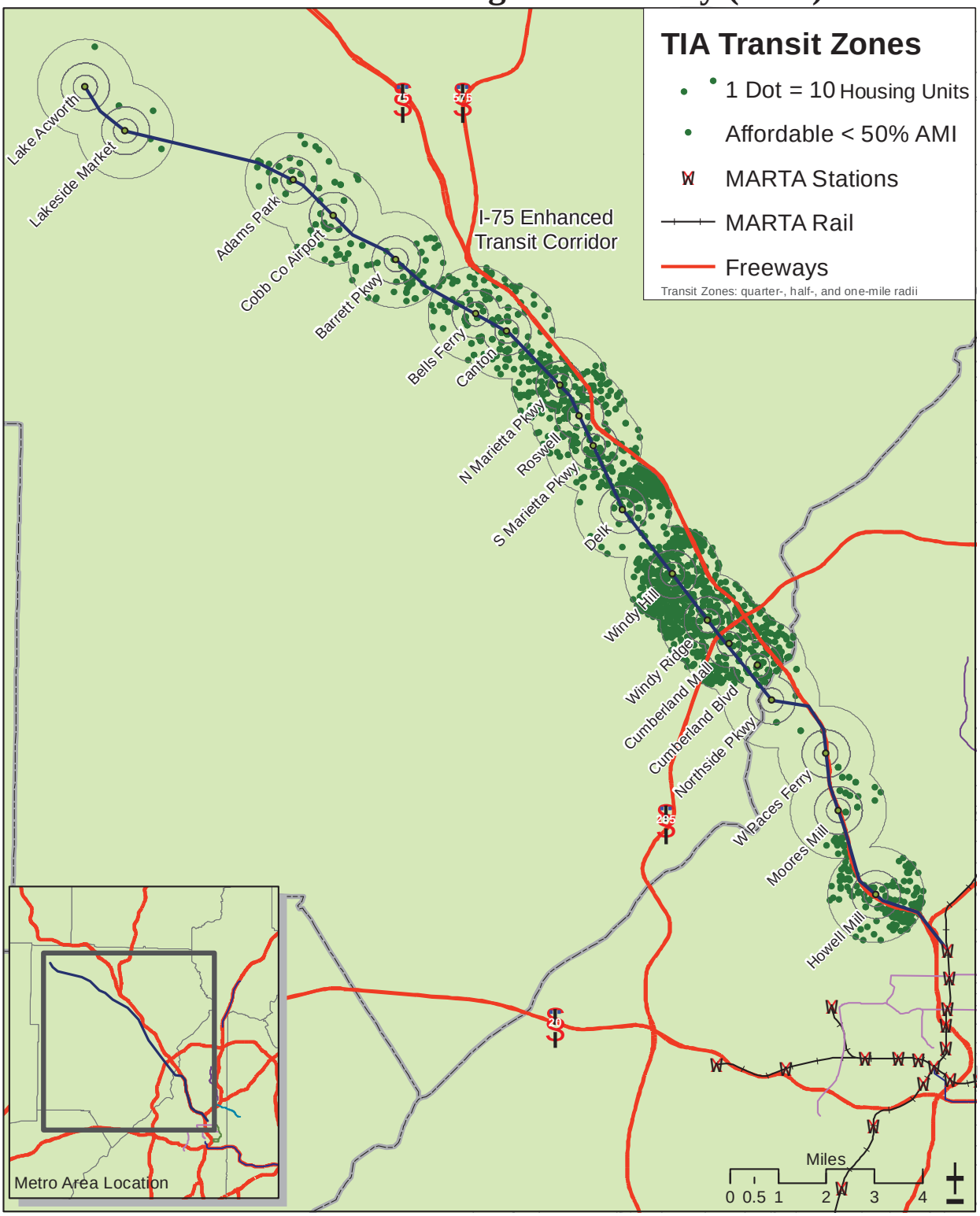


Map A-9: Workforce Housing near the Central TIA Projects, Density



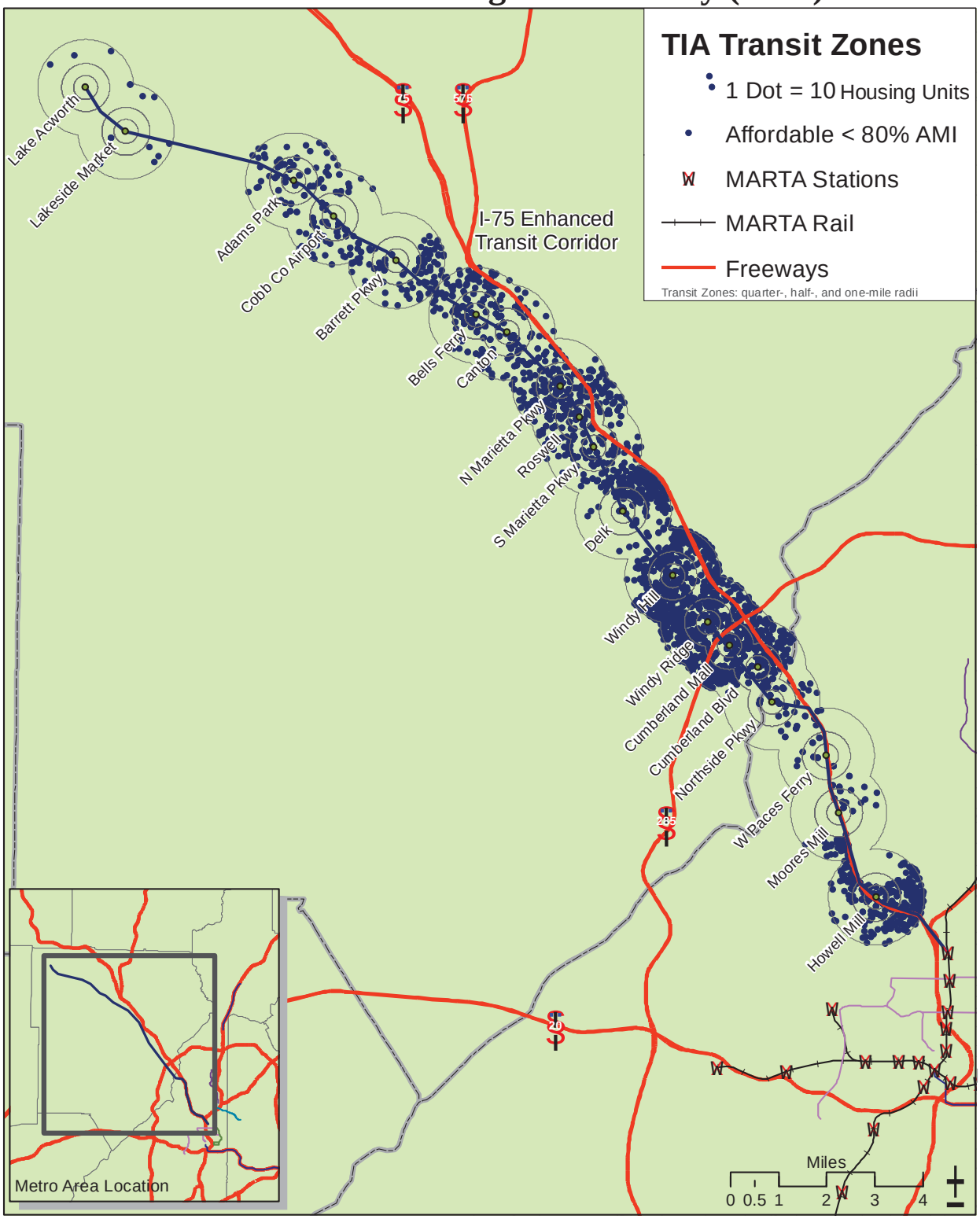
Map A-10: Workforce Housing near the Central TIA Projects, Percentage

TIA-Northwest: Rental Housing Affordability (2010)

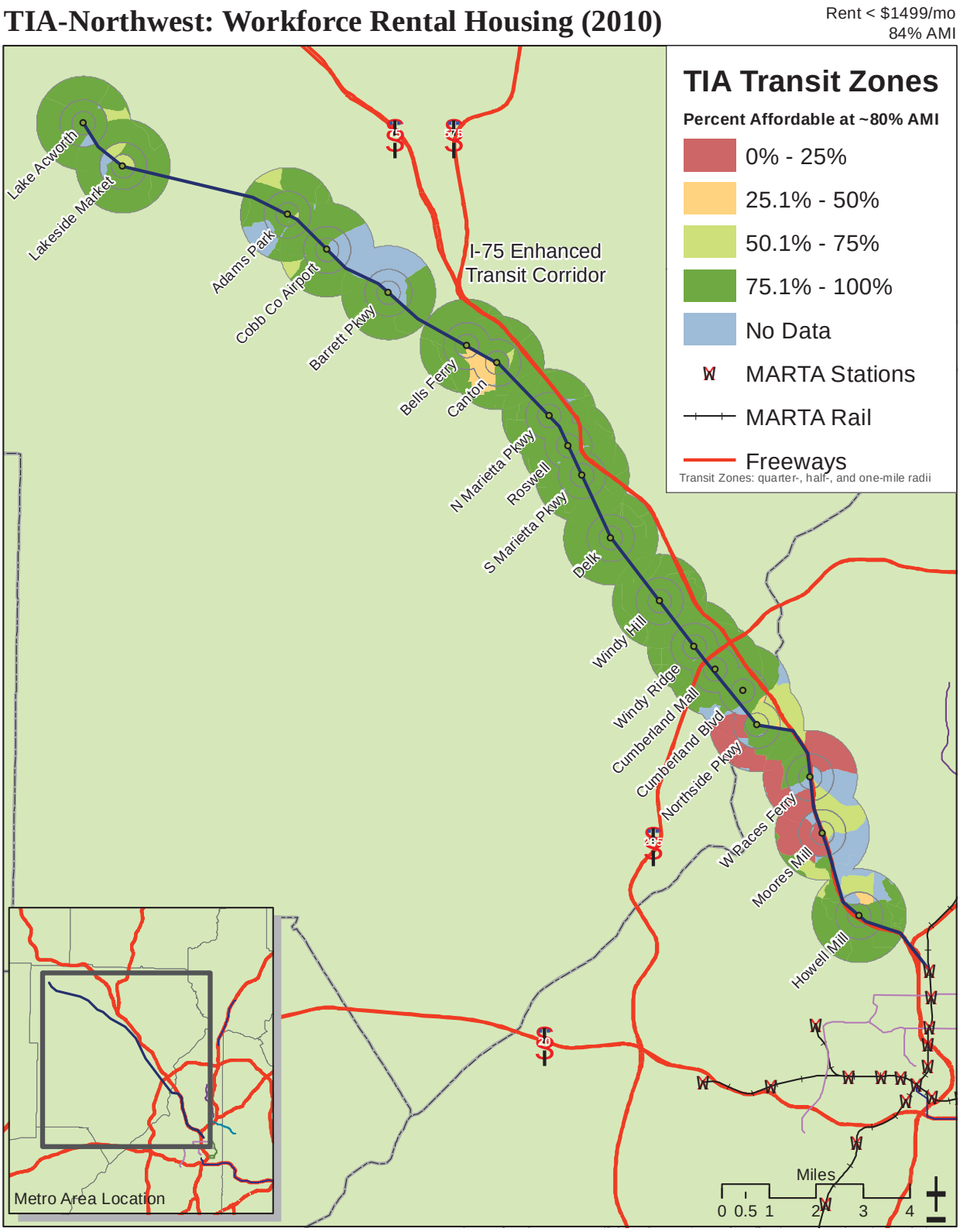


Map A-11: Affordable Housing near the I-75 Corridor, Density

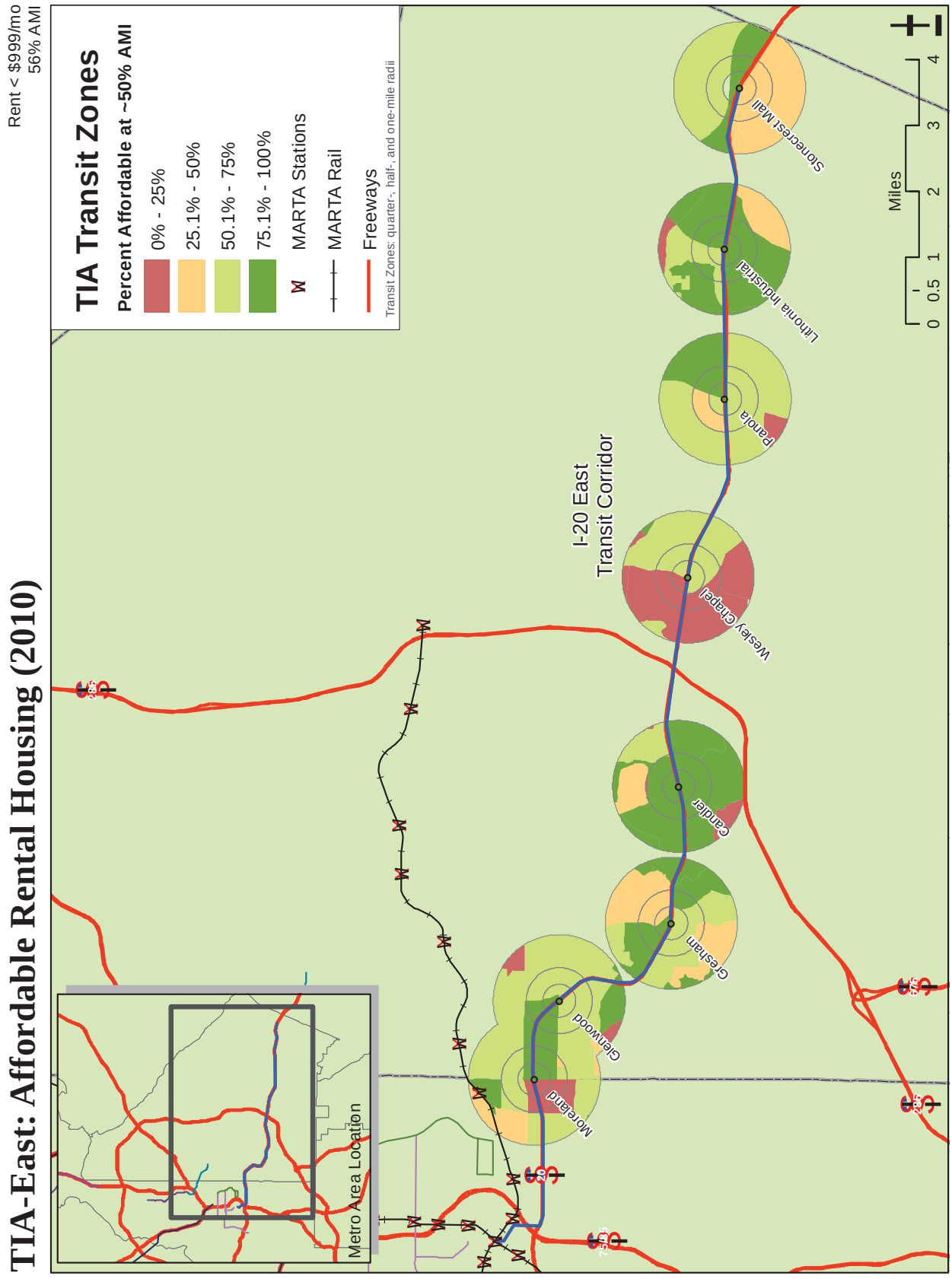
TIA-Northwest: Rental Housing Affordability (2010)



Map A-12: Workforce Housing near the I-75 Corridor, Density

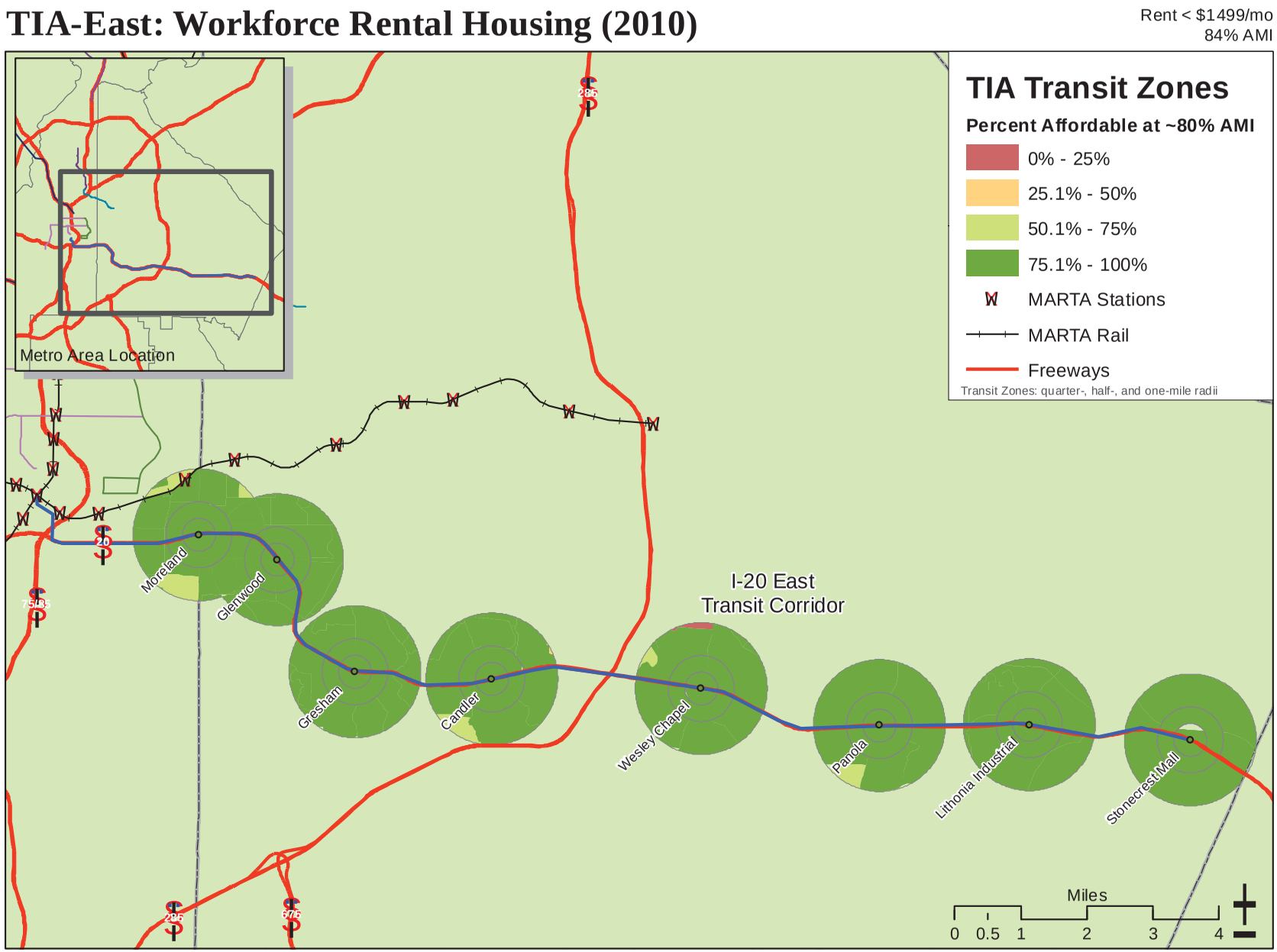


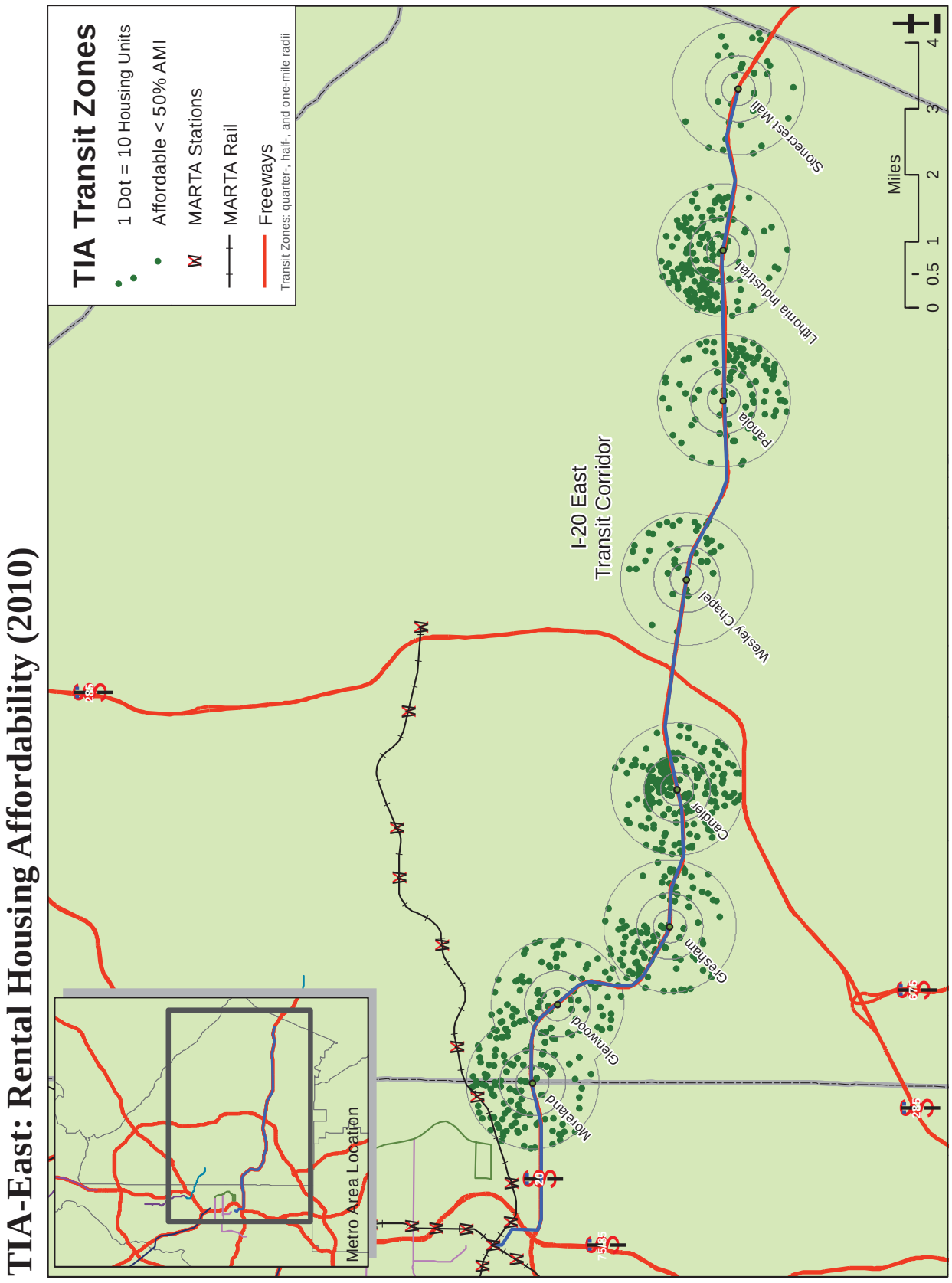
Map A-13: Workforce Housing near the I-75 Corridor, Percentage



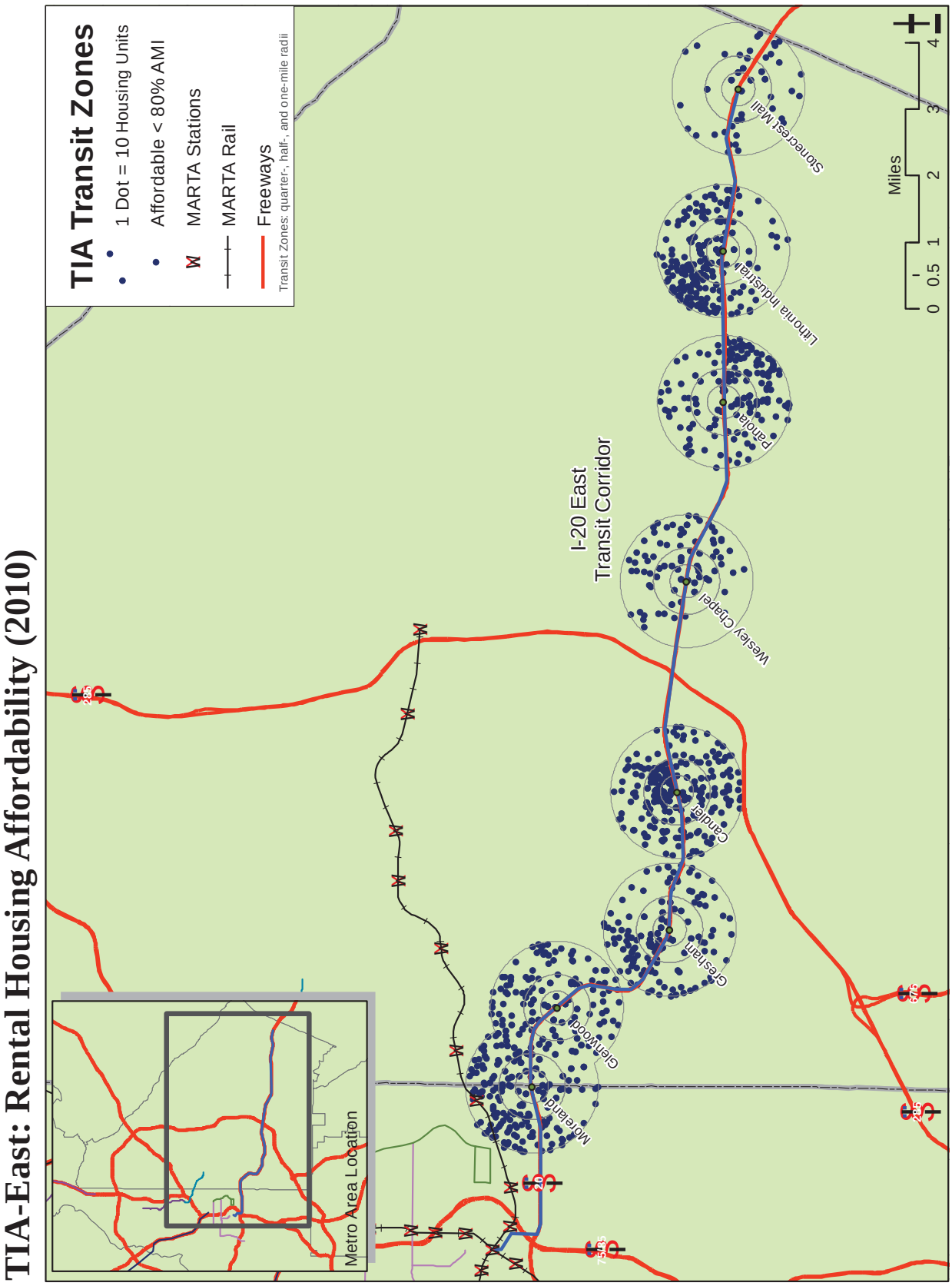
Map A-14: Affordable Housing near the I-20 Corridor, Percentage

Map A-15: Workforce Housing near the I-20 Corridor, Percentage

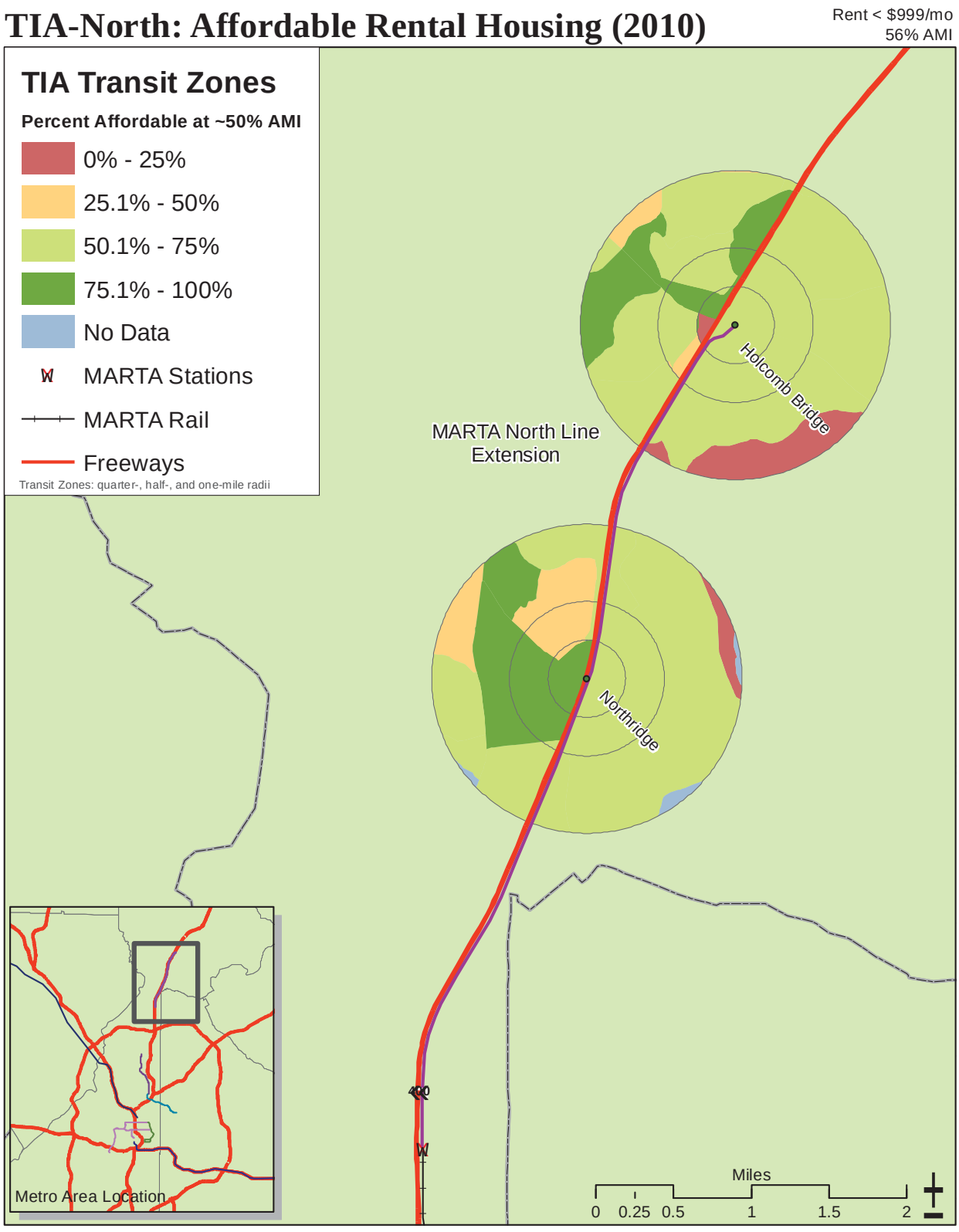




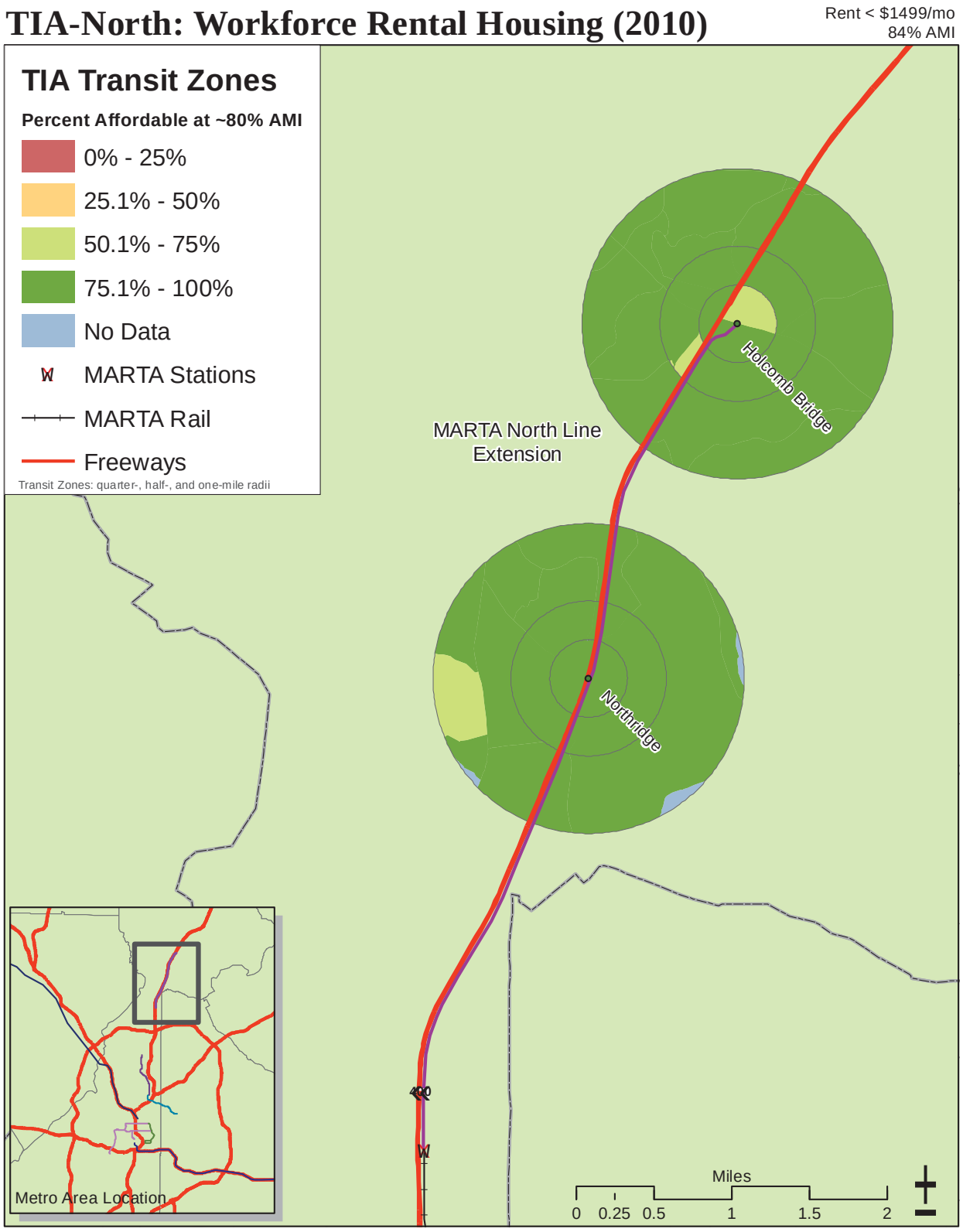
Map A-16: Affordable Housing near the I-20 Corridor, Density



Map A-17: Workforce Housing near the I-20 Corridor, Density

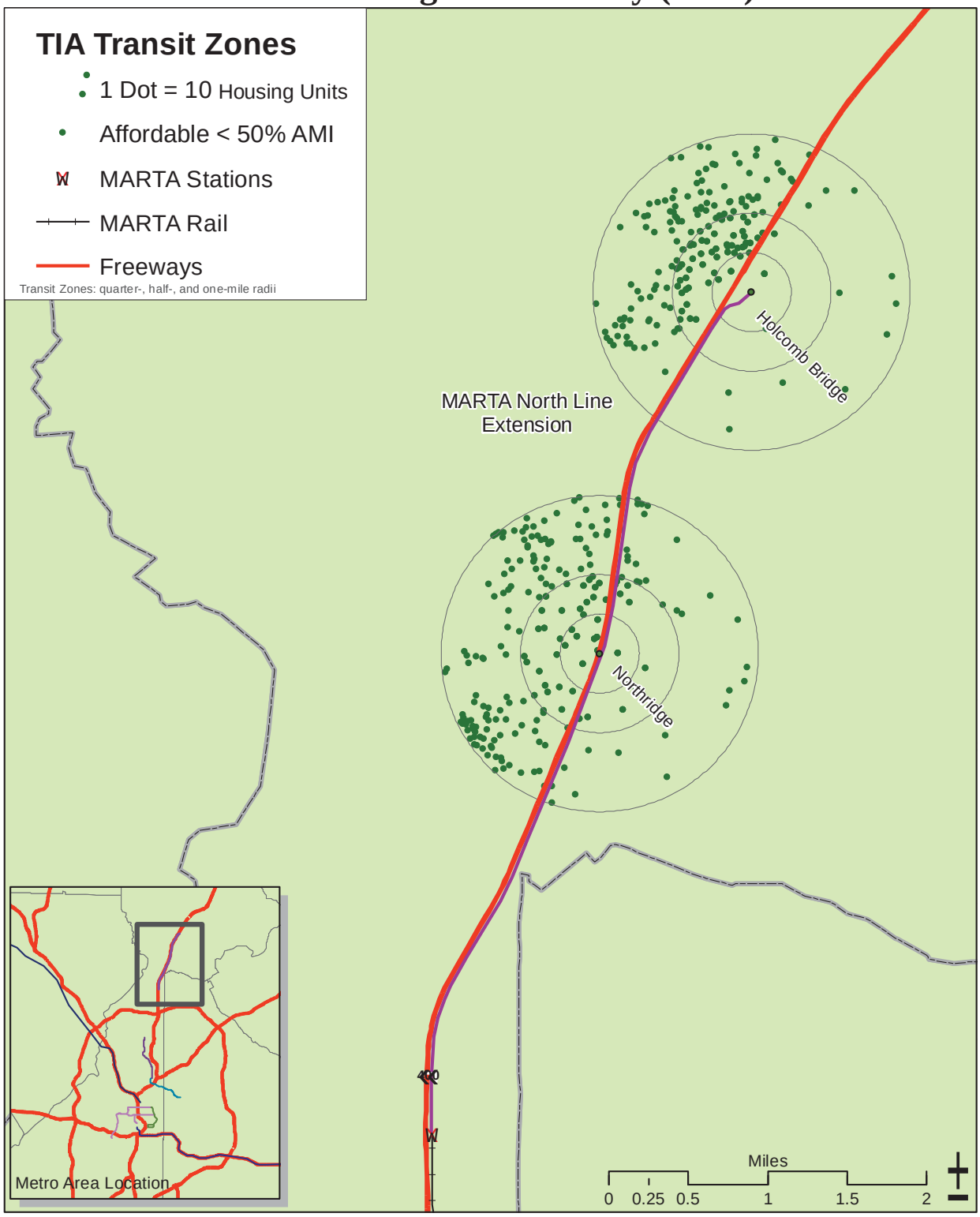


Map A-18: Affordable Housing near the North Line Extension, Percentage



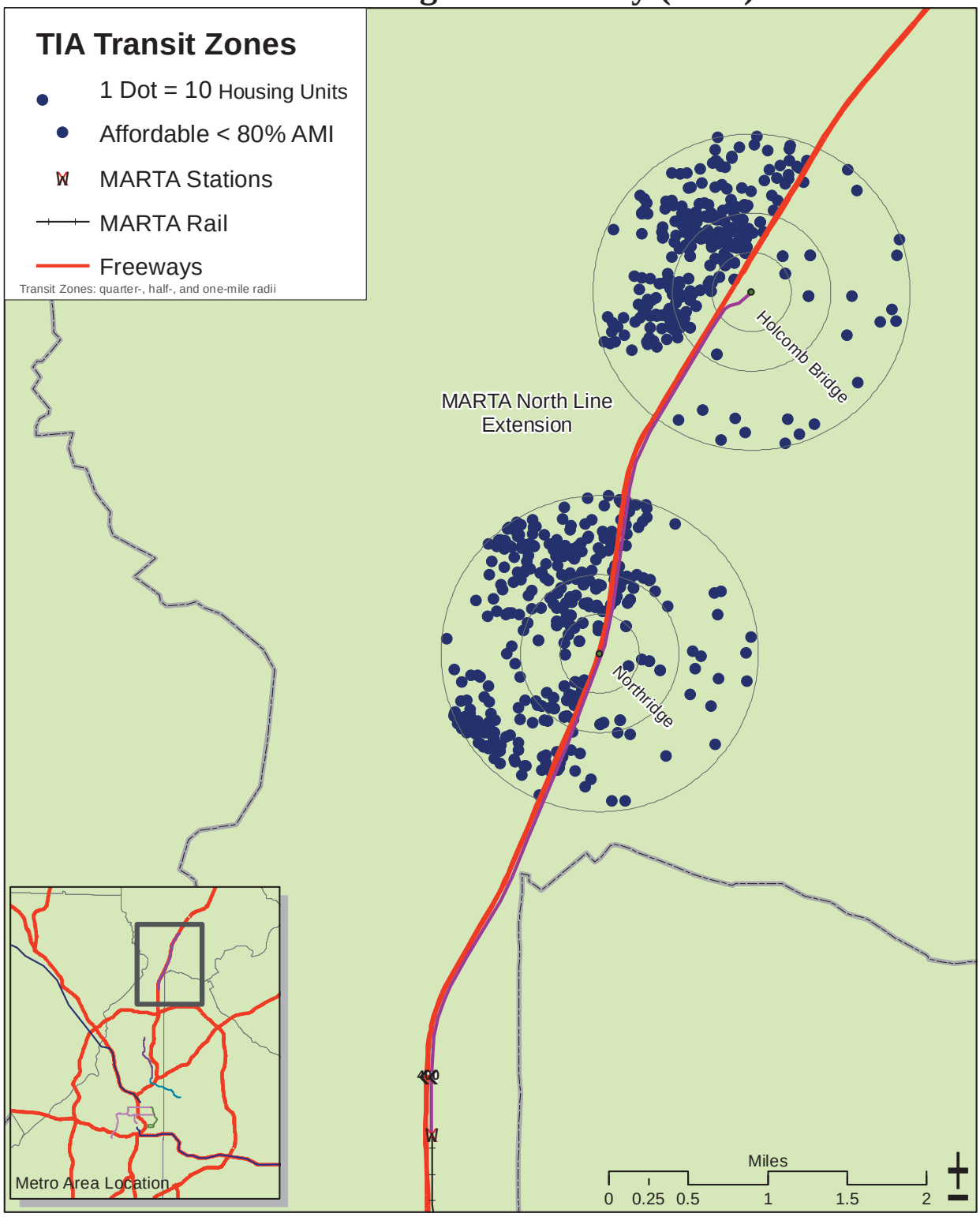
Map A-19: Workforce Housing near the North Line Extension, Percentage

TIA-North: Rental Housing Affordability (2010)



Map A-20: Affordable Housing near the North Line Extension, Density

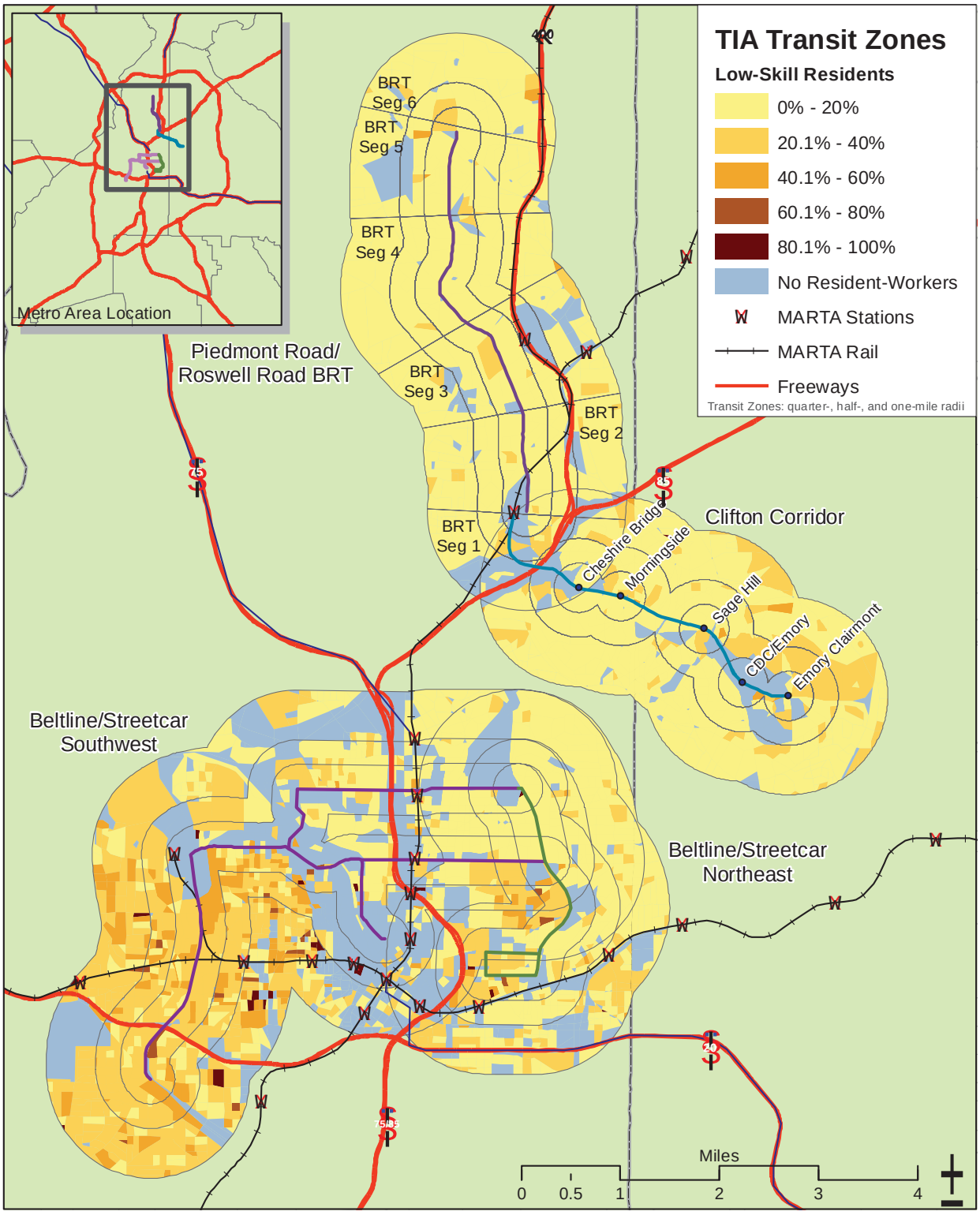
TIA-North: Rental Housing Affordability (2010)



Map A-21: Workforce Housing near the North Line Extension, Density

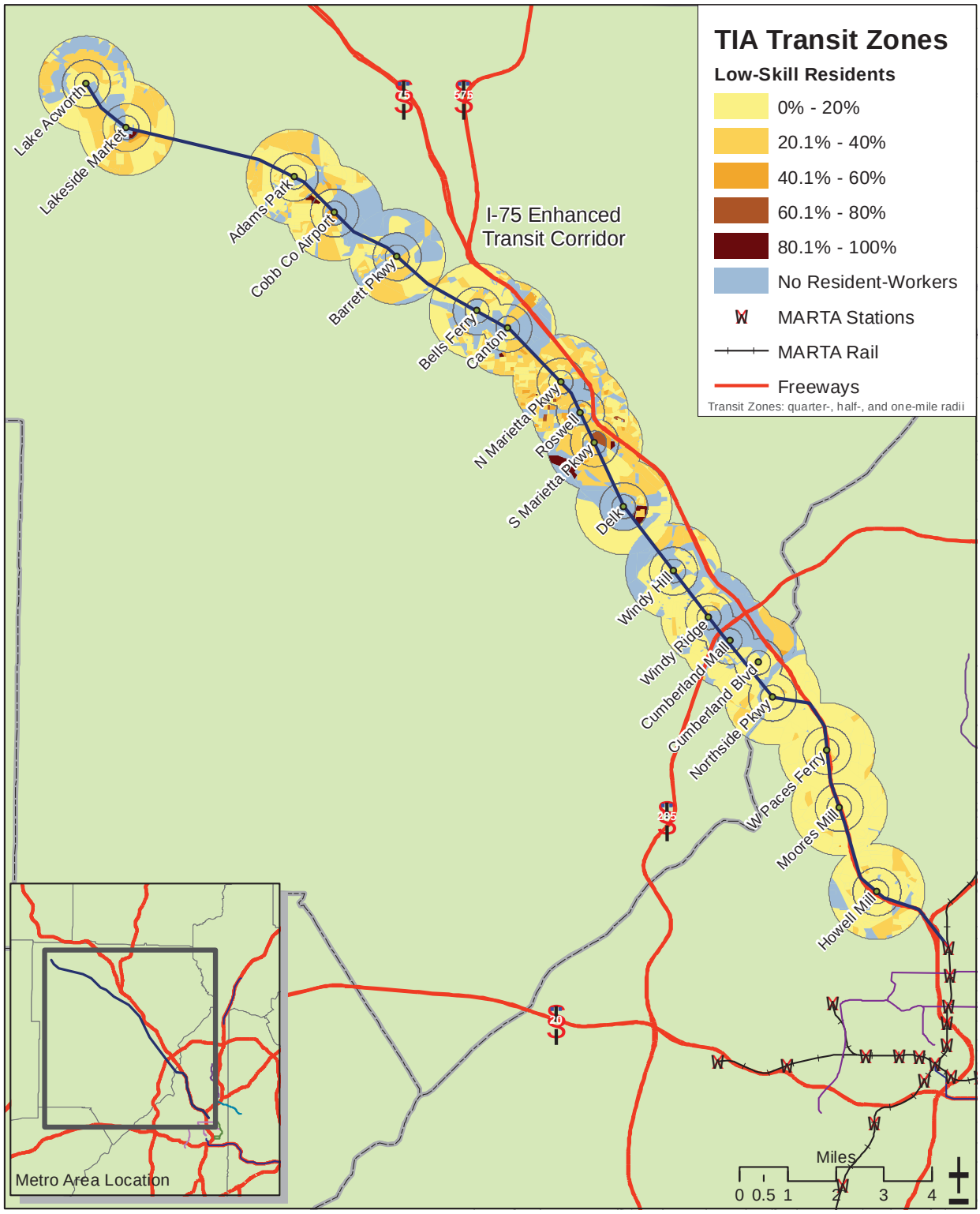
TIA-Central: Low-Skill Workers Near Transit (2009)

Where Workers Live



Map A-22: Low-Skill Workers Living Near the Central TIA Projects

TIA-Northwest: Low-Skill Workers Near Transit (2009) Where Workers Live

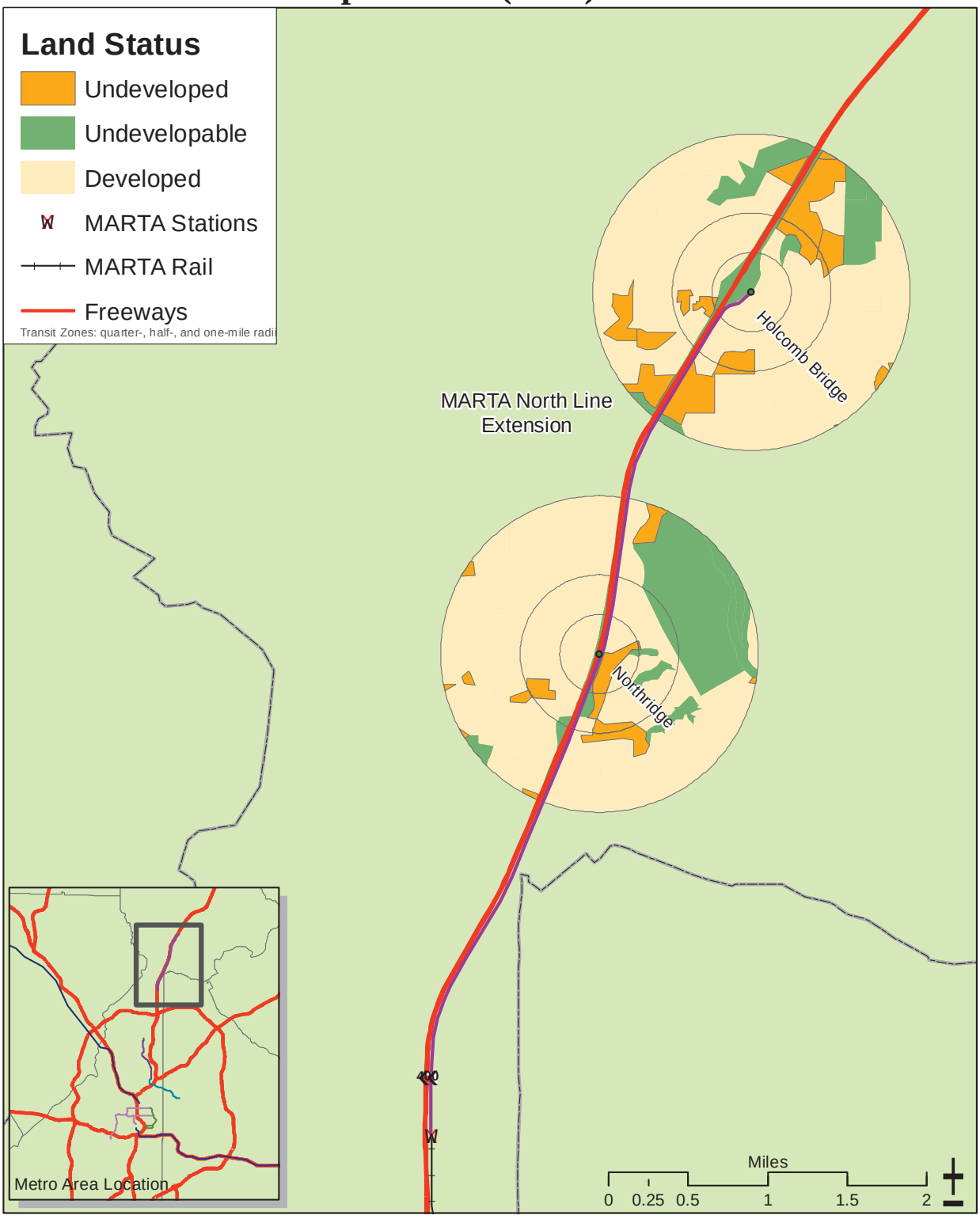


Map A-23: Low-Skill Workers Living Near the I-75 Corridor

TIA-Central: Undeveloped Land (2010)

Map A-24: Undeveloped Land Near the Central TIA Projects

TIA-North: Undeveloped Land (2010)



Map A-25: Undeveloped Land Near the North Line Extension

Appendix B

List of Supplemental Tables:

MARTA Rail: Basic Housing Statistics, One-Mile Transit Zone (Census 2010)							
Station Code	Station Name	Station Typology	Total Housing Units	Housing Density (du/ac)	Percent Renters	Vacant Housing Units	Percent Vacant
Five	Five Points	High Intensity	9,037	4.49	76%	2,369	26%
E1	Georgia State	High Intensity	8,615	4.28	66%	1,915	22%
E2	King Memorial	Neighborhood	10,562	5.25	59%	1,938	18%
E3	Inman Park/Reynoldstown	Neighborhood	10,346	5.15	50%	1,218	12%
E4	Edgewood/Candler Park	Neighborhood	7,888	3.92	42%	755	10%
E5	East Lake	Neighborhood	6,262	3.11	29%	447	7%
E6	Decatur	Mixed Use	7,317	3.64	35%	577	8%
E7	Avondale	Community Center	5,782	2.88	38%	513	9%
E8	Kensington	Community Center	5,884	2.93	68%	1,045	18%
E9	Indian Creek	Commuter	3,617	1.80	43%	536	15%
East			**75,310**	**3.75**	**51%**	**11,313**	**14%**
W1	Dome/GWCC/Philips/CNN	High Intensity	8,348	4.15	76%	2,346	28%
W2	Vine City	Neighborhood	8,393	4.17	76%	2,594	31%
W3	Ashby	Mixed Use	9,119	4.54	77%	3,194	35%
P4	Bankhead	Neighborhood	6,385	3.18	71%	2,710	42%
W4	West Lake	Neighborhood	5,184	2.58	57%	1,821	35%
W5	HE Holmes	Commuter	4,935	2.45	65%	1,308	27%
West			**42,364**	**3.51**	**70%**	**13,973**	**33%**
N1	Peachtree Center	High Intensity	12,533	6.23	74%	3,112	25%
N2	Civic Center	High Intensity	16,077	8.00	66%	3,335	21%
N3	North Avenue	High Intensity	18,108	9.01	63%	3,327	18%
N4	Midtown	High Intensity	18,271	9.09	59%	3,414	19%
N5	Arts Center	High Intensity	15,891	7.90	51%	2,931	18%
N6	Lindbergh Center	Mixed Use	11,079	5.51	65%	1,689	15%
N7	Buckhead	High Intensity	11,088	5.51	54%	1,893	17%
N8	Medical Center	Commuter	3,634	1.81	38%	405	11%
N9	Dunwoody	Mixed Use	6,165	3.07	73%	748	12%
N10	Sandy Springs	Mixed Use	5,926	2.95	62%	659	11%
N11	North Springs	Commuter	7,131	3.55	56%	845	12%
North			**125,903**	**5.69**	**60%**	**22,358**	**16%**
NE7	Lenox	Mixed Use	11,160	5.55	52%	1,736	16%
NE8	Brookhaven	Community Center	8,869	4.41	51%	777	9%
NE9	Chamblee	Commuter	3,079	1.53	72%	355	12%
NE10	Doraville	Commuter	2,896	1.44	70%	271	9%
Northeast			**26,004**	**3.23**	**61%**	**3,139**	**11%**
S1	Garnett	High Intensity	7,334	3.65	80%	1,423	19%
S2	West End	Community Center	7,317	3.64	77%	1,720	24%
S3	Oakland City	Neighborhood	4,802	2.39	58%	1,201	25%
S4	Lakewood	Commuter	3,538	1.76	59%	698	20%
S5	East Point	Community Center	4,874	2.42	51%	1,096	22%
S6	College Park	Community Center	1,927	0.96	70%	429	22%
S7	Airport	Commuter	161	0.08	93%	46	29%
South			**29,953**	**2.13**	**70%**	**6613**	**23%**

Figure B-1: MARTA Housing Characteristics

TIA Transit Projects: Basic Housing Characteristics, One-Mile Transit Zone (Census 2010)						
Station Code	Project Name	Total Housing Units	Housing Density (du/ac)	Percent Renters	Vacant Housing Units	Percent Vacancy
C4	Clifton Corridor CDC/Emory	4,510	2.24	49%	370	8%
C1	Clifton Corridor Cheshire Bridge	8,074	4.02	65%	1,092	14%
C5	Clifton Corridor Emory Clairmont	4,424	2.20	47%	408	9%
C2	Clifton Corridor Morningside	6,405	3.19	53%	576	9%
C3	Clifton Corridor Sage Hill	6,148	3.06	51%	482	8%
		29,561	**2.94**	**53%**	**2,928**	**10%**
NW17	Enhanced Premium Transit Service - Adams Park	2,875	1.43	24%	246	9%
NW15	Enhanced Premium Transit Service - Barrett Pkwy	3,791	1.89	67%	351	9%
NW14	Enhanced Premium Transit Service - Bells Ferry	1,353	0.67	40%	138	10%
NW13	Enhanced Premium Transit Service - Canton	1,515	0.75	54%	172	11%
NW16	Enhanced Premium Transit Service - Cobb Co Airport	2,504	1.25	57%	201	8%
NW5	Enhanced Premium Transit Service - Cumberland Blvd	5,200	2.59	74%	525	10%
NW6	Enhanced Premium Transit Service - Cumberland Mall	5,566	2.77	80%	503	9%
NW9	Enhanced Premium Transit Service - Delk	4,107	2.04	93%	1,074	26%
NW1	Enhanced Premium Transit Service - Howell Mill	7,053	3.51	50%	787	11%
NW19	Enhanced Premium Transit Service - Lake Acworth	496	0.25	14%	25	5%
NW18	Enhanced Premium Transit Service - Lakeside Market	1,322	0.66	13%	55	4%
NW2	Enhanced Premium Transit Service - Moores Mill	3,489	1.74	21%	219	6%
NW12	Enhanced Premium Transit Service - N Marietta Pkwy	2,896	1.44	63%	411	14%
NW4	Enhanced Premium Transit Service - Northside Pkwy	3,461	1.72	55%	359	10%
NW11	Enhanced Premium Transit Service - Roswell	2,685	1.34	70%	324	12%
NW10	Enhanced Premium Transit Service - S Marietta Pkwy	2,923	1.45	78%	499	17%
NW3	Enhanced Premium Transit Service - W Paces Ferry	1,885	0.94	17%	108	6%
NW8	Enhanced Premium Transit Service - Windy Hill	6,885	3.42	90%	810	12%
NW7	Enhanced Premium Transit Service - Windy Ridge	5,731	2.85	82%	537	9%
		65,737	**1.72**	**55%**	**7,344**	**11%**
D4	I-20 Candler	4,662	2.32	61%	814	17%
D2	I-20 Glenwood	5,095	2.53	42%	743	15%
D3	I-20 Gresham	4,262	2.12	41%	664	16%
D7	I-20 Lithonia Industrial	3,916	1.95	71%	780	20%
D1	I-20 Moreland	7,398	3.68	38%	979	13%
D6	I-20 Panola	3,481	1.73	60%	447	13%
D8	I-20 Stonecrest Mall	1,336	0.66	74%	151	11%
D5	I-20 Wesley Chapel	3,375	1.68	41%	300	9%
		33,525	**2.08**	**53%**	**4,878**	**14%**
N13	MARTA North Holcomb Bridge	5,640	2.81	72%	516	9%
N12	MARTA North Northridge	6,053	3.01	78%	572	9%
		11,693	**2.91**	**75%**	**1,088**	**9%**
Corridor Analyses:						
SCSW	Beltline/Streetcar - Downtown and Midtown to Southwest	61,529	**5.13**	62%	14,043	23%
SCNE	Beltline/Streetcar - Downtown to Northeast	38,682	**7.21**	55%	5,528	14%
B1	Piedmont Rd/Roswell Rd BRT-Seg1 (southern end)	4,973	5.12	77%	828	17%
B2	Piedmont Rd/Roswell Rd BRT-Seg2	7,669	5.68	55%	1,046	14%
B3	Piedmont Rd/Roswell Rd BRT-Seg3	8,800	6.38	59%	1,584	18%
B4	Piedmont Rd/Roswell Rd BRT-Seg4	3,322	2.16	34%	386	12%
B5	Piedmont Rd/Roswell Rd BRT-Seg5	2,146	1.84	30%	168	8%
B6	Piedmont Rd/Roswell Rd BRT-Seg6 (northern end)	2,799	3.00	60%	310	11%
		29,709	**4.03**	**53%**	**4,322**	**13%**

Figure B-2: TIA Housing Characteristics

MARTA Rail: Job Characteristics *One-Mile Transit Zone*								
					Job-Worker Ratio		Job-Housing Balance	
Station Code	Station Name	Job Density (ac.)	Percent Low-Skill (LS) Jobs	Percent LS Worker-Residents	Jobs per Worker	LS Jobs per LS Worker	Jobs per Housing Unit	LS Jobs per Low-Burden Housing
Five	Five Points	53.15	13%	22%	20.65	12.62	11.83	4.55
E1	Georgia State	52.20	13%	20%	17.85	11.64	12.18	4.13
E2	King Memorial	38.13	11%	18%	9.63	5.82	7.26	2.13
E3	Inman Park-Reynoldstown	2.84	27%	18%	0.67	1.02	0.55	0.33
E4	Edgewood-Candler Park	2.10	33%	17%	0.52	0.99	0.54	0.32
E5	East Lake	2.90	10%	17%	0.83	0.48	0.93	0.17
E6	Decatur	6.95	16%	16%	1.98	2.06	1.91	0.61
E7	Avondale	7.23	17%	16%	2.85	3.18	2.51	0.86
E8	Kensington	0.94	28%	25%	0.33	0.37	0.32	0.23
E9	Indian Creek	0.39	43%	26%	0.18	0.31	0.21	0.18
		12.63				**2.88**		**1.00**
N1	Peachtree Center	65.48	12%	20%	17.49	11.01	10.50	3.35
N2	Civic Center	61.00	13%	17%	11.90	9.06	7.63	2.49
N3	North Avenue	37.73	11%	15%	6.54	4.65	4.19	1.06
N4	Midtown	27.25	12%	14%	4.37	3.57	3.00	0.79
N5	Arts Center	17.58	13%	14%	4.09	3.98	2.22	0.74
N6	Lindbergh Center	7.82	14%	13%	2.94	3.21	1.42	0.41
N7	Buckhead	23.82	17%	12%	10.95	15.74	4.32	1.63
N8	Medical Center	21.49	11%	14%	15.49	11.99	11.89	1.94
N9	Dunwoody	27.09	13%	13%	18.72	19.39	8.84	2.63
N10	Sandy Springs	18.07	13%	13%	8.27	8.12	6.13	1.57
N11	North Springs	7.66	9%	16%	2.33	1.27	2.16	0.37
		28.63				**8.36**		**1.54**
NE7	Lenox	19.48	17%	13%	8.67	11.63	3.51	1.31
NE8	Brookhaven	1.96	17%	14%	0.61	0.76	0.45	0.16
NE9	Chamblee	4.19	21%	16%	4.21	5.55	2.74	1.12
NE10	Doraville	3.53	21%	23%	2.92	2.58	2.45	1.12
		7.29				**5.13**		**0.93**
S1	Garnett	44.85	14%	25%	19.95	11.51	12.30	5.06
S2	West End	3.29	20%	31%	1.33	0.84	0.90	0.73
S3	Oakland City	0.94	9%	28%	0.42	0.13	0.39	0.10
S4	Lakewood-Ft. McPherson	1.02	11%	26%	0.66	0.27	0.58	0.19
S5	East Point	3.21	30%	25%	1.36	1.59	1.32	1.00
S6	College Park	3.55	15%	27%	4.01	2.20	3.71	1.33
S7	Airport	6.81	12%	31%	68.85	26.78	85.10	8.78
		9.10				**6.19**		**2.46**
W1	Dome/GWCC/Philips/CNN	52.68	13%	25%	20.50	11.12	12.69	4.96
W2	Vine City	34.73	15%	28%	13.28	7.00	8.32	4.55
W3	Ashby	2.97	16%	31%	1.14	0.59	0.66	0.51
P4	Bankhead	1.59	18%	30%	0.95	0.58	0.50	0.51
W4	West Lake	0.45	14%	30%	0.25	0.11	0.18	0.08
W5	Hamilton E. Holmes	1.19	13%	31%	0.85	0.36	0.48	0.23
		15.60				**3.29**		**1.80**

Figure B-3: MARTA Employment Characteristics

Figure B-4: TIA Employment Characteristics

TIA Transit Projects: Job Characteristics
One-Mile Transit Zone

Station Code	Project Name	Job Density (ac.)	Percent Low-Skill Jobs	Percent Low-Skill Worker-Residents	Job-Worker Ratio		Jobs-Housing Balance	
					Jobs per Worker	LS Jobs per LS Worker	Jobs per Housing Unit	LS Jobs per Affordable Housing
C4	Clifton Corridor CDC/Emory	12.77	16%	15%	6.60	6.91	5.69	6.93
C1	Clifton Corridor Cheshire Bridge	4.94	16%	14%	1.64	1.88	1.23	0.77
C5	Clifton Corridor Emory Clairmont	12.38	16%	16%	7.53	7.66	5.63	6.71
C2	Clifton Corridor Morningside	2.83	21%	13%	0.95	1.51	0.89	0.81
C3	Clifton Corridor Sage Hill	2.64	14%	14%	1.08	1.05	0.86	0.67
		7.11				**3.80**		**3.18**
NW17	Enhanced Premium Transit Service - Adams Park	1.22	26%	19%	0.70	0.95	0.27	2.41
NW15	Enhanced Premium Transit Service - Barrett Pkwy	4.67	21%	18%	5.83	6.69	0.84	4.26
NW14	Enhanced Premium Transit Service - Bells Ferry	5.17	10%	18%	7.54	4.38	2.10	1.36
NW13	Enhanced Premium Transit Service - Canton	7.30	10%	20%	8.32	4.28	3.23	1.90
NW16	Enhanced Premium Transit Service - Cobb Co Airport	2.97	19%	19%	3.53	3.56	0.57	3.57
NW5	Enhanced Premium Transit Service - Cumberland Blvd	15.00	13%	14%	8.64	8.22	0.95	2.80
NW6	Enhanced Premium Transit Service - Cumberland Mall	14.73	17%	15%	5.39	6.18	0.96	2.14
NW9	Enhanced Premium Transit Service - Delk	4.34	15%	25%	2.77	1.68	0.95	0.66
NW1	Enhanced Premium Transit Service - Howell Mill	4.21	20%	14%	1.47	2.10	0.62	1.17
NW19	Enhanced Premium Transit Service - Lake Acworth	0.61	39%	20%	2.69	5.10	0.47	18.04
NW18	Enhanced Premium Transit Service - Lakeside Market	1.57	43%	21%	2.17	4.45	0.84	32.02
NW2	Enhanced Premium Transit Service - Moores Mill	1.47	13%	13%	1.12	1.15	0.26	1.25
NW12	Enhanced Premium Transit Service - N Marietta Pkwy	6.37	8%	24%	4.47	1.47	1.49	0.73
NW4	Enhanced Premium Transit Service - Northside Pkwy	5.56	9%	14%	4.44	3.03	0.58	2.60
NW11	Enhanced Premium Transit Service - Roswell	7.20	10%	25%	6.77	2.75	1.50	1.08
NW10	Enhanced Premium Transit Service - S Marietta Pkwy	7.14	9%	25%	5.62	2.00	1.41	1.14
NW3	Enhanced Premium Transit Service - W Paces Ferry	2.69	13%	13%	3.34	3.33	0.69	8.40
NW8	Enhanced Premium Transit Service - Windy Hill	7.99	19%	19%	2.94	3.05	1.07	0.85
NW7	Enhanced Premium Transit Service - Windy Ridge	15.13	17%	16%	5.58	5.89	1.50	1.79
		6.07				**3.70**		**4.64**
D4	I-20 Candler	1.05	42%	26%	0.51	0.80	0.45	0.47
D2	I-20 Glenwood	0.71	41%	23%	0.31	0.57	0.28	0.59
D3	I-20 Gresham	0.28	27%	26%	0.15	0.16	0.13	0.16
D7	I-20 Lithonia Industrial	0.58	28%	24%	0.45	0.53	0.30	0.21
D1	I-20 Moreland	1.68	34%	19%	0.48	0.85	0.46	0.92
D6	I-20 Panola	3.09	17%	23%	3.37	2.44	1.79	1.02
D8	I-20 Stonecrest Mall	1.78	56%	23%	10.41	25.55	2.67	6.99
D5	I-20 Wesley Chapel	1.31	36%	24%	0.77	1.16	0.78	2.36
		1.31				**4.01**		**1.59**
N13	MARTA North Holcomb Bridge	2.99	22%	21%	1.02	1.10	1.06	0.74
N12	MARTA North Northridge	3.49	15%	20%	1.09	0.79	1.16	0.49
		3.24				**0.95**		**0.61**
Corridor Analyses:								
SCSW	Beltline/Streetcar - Downtown and Midtown to Southwest	15.89	13%	20%	4.66	3.13	3.09	1.55
SCNE	Beltline/Streetcar - Downtown to Northeast	20.86	13%	15%	4.03	3.42	2.89	1.59
B1	Piedmont Rd/Roswell Rd BRT-Seg1 (southern end)	8.11	12%	14%	2.99	2.59	1.59	0.21
B2	Piedmont Rd/Roswell Rd BRT-Seg2	6.36	17%	13%	2.56	3.39	1.12	0.32
B3	Piedmont Rd/Roswell Rd BRT-Seg3	32.40	18%	13%	16.36	23.50	5.08	3.14
B4	Piedmont Rd/Roswell Rd BRT-Seg4	3.58	14%	11%	2.53	3.22	1.66	0.66
B5	Piedmont Rd/Roswell Rd BRT-Seg5	1.50	28%	11%	1.06	2.68	0.82	0.88
B6	Piedmont Rd/Roswell Rd BRT-Seg6 (northern end)	1.74	26%	15%	0.69	1.22	0.58	0.43
		8.95				**6.10**		**0.94**

MARTA: Rental Housing Affordability *One-Mile Transit Zone*						
Station Code	Station Name	Total Rental Units	Units below 50% AMI	Percent below 50% AMI	Units below 80% AMI	Percent below 80% AMI
Five		4,759	3,493	73%	4,491	94%
E1	Georgia State	4,180	2,860	68%	3,892	93%
E2	King Memorial	4,387	2,738	62%	4,066	93%
E3	Inman Park/Reynoldstown	3,748	1,998	53%	3,274	87%
E4	Edgewood/Candler Park	2,660	1,598	60%	2,223	84%
E5	East Lake	1,596	988	62%	1,364	85%
E6	Decatur	2,482	1,768	71%	2,284	92%
E7	Avondale	1,978	1,321	67%	1,854	94%
E8	Kensington	3,302	2,978	90%	3,272	99%
E9	Indian Creek	1,714	1,313	77%	1,659	97%
				68%		92%
N1	Peachtree Center	6,863	4,490	65%	6,367	93%
N2	Civic Center	7,935	4,961	63%	7,181	90%
N3	North Avenue	8,937	5,367	60%	7,895	88%
N4	Midtown	7,837	4,038	52%	6,606	84%
N5	Arts Center	5,381	2,702	50%	4,363	81%
N6	Lindbergh Center	5,202	2,450	47%	4,603	88%
N7	Buckhead	4,380	1,648	38%	3,265	75%
N8	Medical Center	1,463	457	31%	1,193	82%
N9	Dunwoody	2,473	769	31%	2,009	81%
N10	Sandy Springs	2,620	932	36%	2,342	89%
N11	North Springs	2,893	1,040	36%	2,672	92%
				46%		86%
NE7	Lenox	4,403	1,407	32%	3,200	73%
NE8	Brookhaven	3,357	1,473	44%	2,752	82%
NE9	Chamblee	1,646	1,031	63%	1,612	98%
NE10	Doraville	1,722	1,165	68%	1,649	96%
				52%		87%
S1	Garnett	3,770	2,841	75%	3,599	95%
S2	West End	3,387	2,664	79%	3,300	97%
S3	Oakland City	1,673	1,177	70%	1,606	96%
S4	Lakewood	1,660	1,380	83%	1,604	97%
S5	East Point	2,016	1,623	81%	2,004	99%
S6	College Park	1,195	1,056	88%	1,192	100%
S7	Airport	272	224	82%	272	100%
				80%		98%
W1	Dome/GWCC/Philips/CNN	4,937	3,659	74%	4,706	95%
W2	Vine City	4,586	3,443	75%	4,458	97%
W3	Ashby	4,169	3,365	81%	4,052	97%
P4	Bankhead	2,246	1,837	82%	2,201	98%
W4	West Lake	1,887	1,444	77%	1,792	95%
W5	HE Holmes	1,609	1,266	79%	1,605	100%
				78%		97%
AVERAGE				66%		92%
		KEY:		< 50%		<75%
				>90%		>95%

Figure B-5: MARTA Rental Housing Affordability

TIA Projects: Rental Housing Affordability *One-Mile Transit Zone*						
Station Code	Project Name	Total Rental Units	Units below 50% AMI	Percent below 50% AMI	Units below 80% AMI	Percent below 80% AMI
C4	Clifton Corridor CDC/Emory	2,012	575	29%	1,572	78%
C1	Clifton Corridor Cheshire Bridge	3,922	2,085	53%	3,565	91%
C5	Clifton Corridor Emory Clairmont	1,786	601	34%	1,481	83%
C2	Clifton Corridor Morningside	2,530	1,495	59%	2,267	90%
C3	Clifton Corridor Sage Hill	2,746	1,084	39%	2,266	83%
				43%		85%
NW17	Enhanced Premium Transit Service - Adams Park	705	261	37%	633	90%
NW15	Enhanced Premium Transit Service - Barrett Pkwy	1,023	463	45%	965	94%
NW14	Enhanced Premium Transit Service - Bells Ferry	1,434	798	56%	1,299	91%
NW13	Enhanced Premium Transit Service - Canton	1,195	785	66%	1,059	89%
NW16	Enhanced Premium Transit Service - Cobb Co Airport	845	317	38%	771	91%
NW5	Enhanced Premium Transit Service - Cumberland Blvd	2,696	1,436	53%	2,558	95%
NW6	Enhanced Premium Transit Service - Cumberland Mall	4,089	2,362	58%	3,978	97%
NW9	Enhanced Premium Transit Service - Delk	2,391	1,967	82%	2,382	100%
NW1	Enhanced Premium Transit Service - Howell Mill	3,124	1,462	47%	2,887	92%
NW19	Enhanced Premium Transit Service - Lake Acworth	61	26	43%	57	93%
NW18	Enhanced Premium Transit Service - Lakeside Market	112	42	38%	104	93%
NW2	Enhanced Premium Transit Service - Moores Mill	754	305	40%	556	74%
NW12	Enhanced Premium Transit Service - N Marietta Pkwy	1,971	1,371	70%	1,940	98%
NW4	Enhanced Premium Transit Service - Northside Pkwy	1,089	404	37%	962	88%
NW11	Enhanced Premium Transit Service - Roswell	1,954	1,341	69%	1,905	97%
NW10	Enhanced Premium Transit Service - S Marietta Pkwy	1,543	1,109	72%	1,514	98%
NW3	Enhanced Premium Transit Service - W Paces Ferry	312	83	27%	224	72%
NW8	Enhanced Premium Transit Service - Windy Hill	4,923	3,613	73%	4,856	99%
NW7	Enhanced Premium Transit Service - Windy Ridge	4,602	2,904	63%	4,472	97%
				53%		92%
D4	I-20 Candler	2,312	1,872	81%	2,282	99%
D2	I-20 Glenwood	1,464	991	68%	1,356	93%
D3	I-20 Gresham	1,400	965	69%	1,323	95%
D7	I-20 Lithonia Industrial	2,074	1,617	78%	2,020	97%
D1	I-20 Moreland	2,049	1,259	61%	1,833	89%
D6	I-20 Panola	1,571	1,008	64%	1,520	97%
D8	I-20 Stonecrest Mall	449	285	63%	440	98%
D5	I-20 Wesley Chapel	853	400	47%	788	92%
				66%		95%
N13	MARTA North Holcomb Bridge	2,599	1,807	70%	2,510	97%
N12	MARTA North Northridge	3,381	2,096	62%	3,218	95%
				66%		96%
Corridor Analyses:						
SCSW	Beltline/Streetcar - Downtown and Midtown to Southwest	27,082	16,536	61%	24,061	89%
SCNE	Beltline/Streetcar - Downtown to Northeast	16,272	9,191	56%	14,229	87%
B1	Piedmont Rd/Roswell Rd BRT-Seg1 (northern end)	10,096	4,652	46%	9,092	90%
B2	Piedmont Rd/Roswell Rd BRT-Seg2	9,428	4,626	49%	8,289	88%
B3	Piedmont Rd/Roswell Rd BRT-Seg3	5,645	2,553	45%	4,590	81%
B4	Piedmont Rd/Roswell Rd BRT-Seg4	2,379	1,154	49%	1,888	79%
B5	Piedmont Rd/Roswell Rd BRT-Seg5	1,405	561	40%	1,276	91%
B6	Piedmont Rd/Roswell Rd BRT-Seg6 (southern end)	1,408	965	69%	1,370	97%
				50%		88%
				56%		90%
		KEY:		< 50%		<75%
				>90%		>95%

Figure B-6: TIA Rental Housing Affordability

MARTA Rail: MITOD Opportunity *One-Mile Transit Zone*				
Station Code	Station Name	Station Typology	Housing Vacancy	Undeveloped Acres
Five	Five Points	Urban Core	26%	81
E1	Georgia State	Urban Core	22%	75
E2	King Memorial	Neighborhood	18%	82
E3	Inman Park/Reynoldstown	Neighborhood	12%	37
E4	Edgewood/Candler Park	Neighborhood	10%	54
E5	East Lake	Neighborhood	7%	29
E6	Decatur	Town Center	8%	7
E7	Avondale	Neighborhood	9%	44
E8	Kensington	Commuter Town Center	18%	206
E9	Indian Creek	Collector	15%	191
			13%	**726**
N1	Peachtree Center	Urban Core	25%	84
N2	Civic Center	Urban Core	21%	42
N3	North Avenue	Urban Core	18%	26
N4	Midtown	Urban Core	19%	44
N5	Arts Center	Urban Core	18%	68
N6	Lindbergh Center	Commuter Town Center	15%	126
N7	Buckhead	Urban Core	17%	49
N8	Medical Center	Special Regional Destination	11%	102
N9	Dunwoody	Town Center	12%	61
N10	Sandy Springs	Commuter Town Center	11%	237
N11	North Springs	Collector	12%	222
			16%	**1,061**
NE7	Lenox	Urban Core	16%	55
NE8	Brookhaven	Town Center	9%	80
NE9	Chamblee	Commuter Town Center	12%	195
NE10	Doraville	Commuter Town Center	9%	64
			11%	**393**
S1	Garnett	Urban Core	19%	65
S2	West End	Neighborhood	24%	63
S3	Oakland City	Neighborhood	25%	27
S4	Lakewood	Town Center	20%	63
S5	East Point	Town Center	22%	109
S6	College Park	Commuter Town Center	22%	302
S7	Airport	Special Regional Destination	29%	241
			23%	**870**
W1	Dome/GWCC/Philips/CNN	Special Regional Destination	28%	40
W2	Vine City	Neighborhood	31%	35
W3	Ashby	Neighborhood	35%	80
P4	Bankhead	Town Center	42%	214
W4	West Lake	Neighborhood	35%	103
W5	HE Holmes	Commuter Town Center	27%	194
			33%	**666**
			21%	**3,797**

Figure B-7: MARTA MITOD Opportunities

TIA Transit Projects: MITOD Opportunity *One-Mile Transit Zone*			
Station Code	Project Name	Housing Vacancy	Undeveloped Area (ac.)
C4	Clifton Corridor CDC/Emory	8%	369
C1	Clifton Corridor Cheshire Bridge	14%	188
C5	Clifton Corridor Emory Clairmont	9%	372
C2	Clifton Corridor Morningside	9%	180
C3	Clifton Corridor Sage Hill	8%	243
		10%	**1,352**
NW17	Enhanced Premium Transit Service - Adams Park	9%	195
NW15	Enhanced Premium Transit Service - Barrett Pkwy	9%	363
NW14	Enhanced Premium Transit Service - Bells Ferry	10%	311
NW13	Enhanced Premium Transit Service - Canton	11%	150
NW16	Enhanced Premium Transit Service - Cobb Co Airport	8%	100
NW5	Enhanced Premium Transit Service - Cumberland Blvd	10%	186
NW6	Enhanced Premium Transit Service - Cumberland Mall	9%	251
NW9	Enhanced Premium Transit Service - Delk	26%	52
NW1	Enhanced Premium Transit Service - Howell Mill	11%	40
NW19	Enhanced Premium Transit Service - Lake Acworth	5%	140
NW18	Enhanced Premium Transit Service - Lakeside Market	4%	218
NW2	Enhanced Premium Transit Service - Moores Mill	6%	47
NW12	Enhanced Premium Transit Service - N Marietta Pkwy	14%	111
NW4	Enhanced Premium Transit Service - Northside Pkwy	10%	248
NW11	Enhanced Premium Transit Service - Roswell	12%	71
NW10	Enhanced Premium Transit Service - S Marietta Pkwy	17%	139
NW3	Enhanced Premium Transit Service - W Paces Ferry	6%	61
NW8	Enhanced Premium Transit Service - Windy Hill	12%	95
NW7	Enhanced Premium Transit Service - Windy Ridge	9%	154
		11%	**2,932**
D4	I-20 Candler	17%	173
D2	I-20 Glenwood	15%	150
D3	I-20 Gresham	16%	192
D7	I-20 Lithonia Industrial	20%	631
D1	I-20 Moreland	13%	3
D6	I-20 Panola	13%	320
D8	I-20 Stonecrest Mall	11%	815
D5	I-20 Wesley Chapel	9%	199
		14%	**2,483**
N13	MARTA North Holcomb Bridge	9%	262
N12	MARTA North Northridge	9%	99
		9%	**361**
Corridor Analyses:			
SCSW	Beltline/Streetcar - Downtown and Midtown to Southwest	23%	461
SCNE	Beltline/Streetcar - Downtown to Northeast	14%	133
B1	Piedmont Rd/Roswell Rd BRT-Seg1 (southern end)	17%	96
B2	Piedmont Rd/Roswell Rd BRT-Seg2	14%	27
B3	Piedmont Rd/Roswell Rd BRT-Seg3	18%	30
B4	Piedmont Rd/Roswell Rd BRT-Seg4	12%	14
B5	Piedmont Rd/Roswell Rd BRT-Seg5	8%	17
B6	Piedmont Rd/Roswell Rd BRT-Seg6 (northern end)	11%	11
		13%	**195**
		13%	7,916

Figure B-8: TIA MITOD Opportunities